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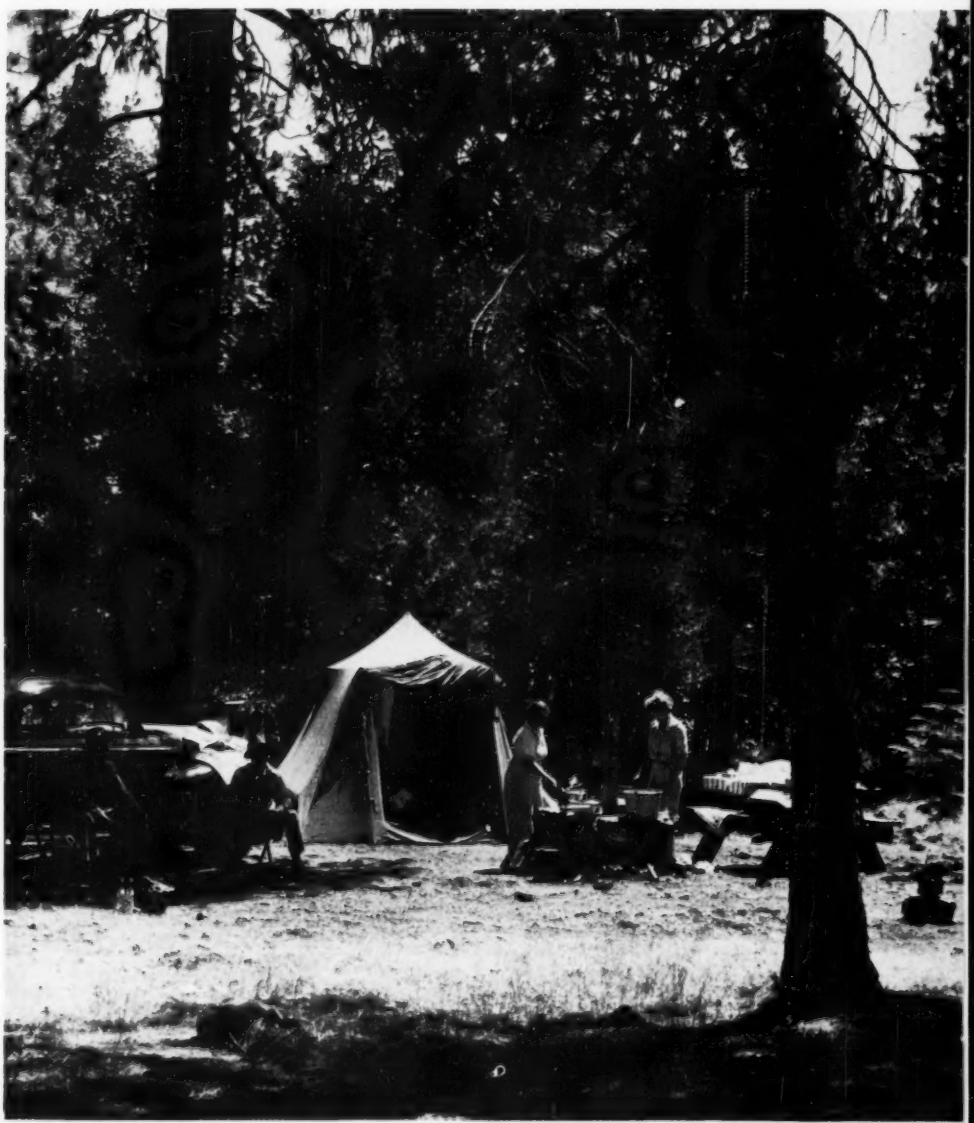

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Photo by Paul Fair

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Journal of Forestry

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Proper Planning of Campgrounds and Picnic Areas[1]

William N. Parke
U. S. Forest Service, Portland, Oreg.

ALTHOUGH FORESTED AREAS are now the focal point for much of the outdoor recreation activities, they were not always so regarded by settlers of this country. To the early pioneers the forests were in conflict with a Nature which was overgenerous in the East, the South, the Lake States, and the West. Forests had to be cleared to raise crops, or paths and roads cut through them to link communities with each other, or to make berry fields or hunting grounds more accessible. Trees provided shelter and warmth, but they were considered bulwarks against the pioneer's soil-bound occupations and means of getting from one place to another. The pioneers apparently enjoyed dubbing elbows with Nature, but what time they had for recreation was usually spent at diversions which draw people together, rather than those which separate them.

Today, outdoor recreation might be considered an escape mechanism which gets its effects from contrasts, and for this reason the various forms of recreation obtainable appeal more to urban than to rural people. The modern counterpart of the pioneer is the ruralist who still does not see much contrast between his rural life and the recreational opportunities of the forests. This was borne out in a sampling of recreation visitors in the national forests of Washington in 1937, in which only 7 percent of residents who answered questionnaires were agriculturists, despite the fact that 43 percent of the state's population was classified as rural. The people of the West are accustomed to plenty of room and have more of it, even in towns and cities, than their eastern cousins. The desire to get out into the open is not as pressing with residents of states such as Oregon and Washington, as it is with residents of eastern states. Nevertheless, camping and picnicking in forested areas, even in these western states, are two of our most important recreation activities.

FIG. 1.—Sign at entrance to the Tumwater Recreation Area, Wenatchee National Forest, Washington.

Since most of the forest recreation visitors are generally considered as coming from urban areas, one might suppose that forest campgrounds and picnic areas should be highly developed. This would probably be true if it were not for the fact that there are countless numbers of municipal, county, and state recreation areas which are intensively developed and normally situated within ready access to urban populations. City parks and playgrounds have a definite purpose and need, and to many they are the best, if not the only, substitute for a primeval recreation area. Because the forests in general occupy the upper mountainous areas and hilly country, they offer opportunities for outdoor types of recreation varying from hiking and camping in wilderness areas to sightseeing along highways and picnicking in developed spots. The planning and design of municipal and state parks and facilities is a highly specialized job requiring the talents of architects and landscape architects. The planning of most campgrounds and picnic areas in forested areas is a job that can usually be handled by foresters with certain training and an aptitude for this sort of work. The planning of some of

[1]Paper presented at a meeting of the Division of Forest Recreation, Society of American Foresters, Biloxi, Miss., December 14, 1951.

the larger or problem areas should be done by landscape architects, or in consultation with them.

In the western forest regions there is a wide variation concerning the appropriate designation for areas used for camping and picnicking. "Forest Camp," "Campground," "Public Campground," "Recreation Area," and "Picnic Area" are commonly used, and for some of us, hardly a day goes by that we do not hear forest recreation areas referred to as "Parks." Certainly the most appropriate name for an area used exclusively for picnicking is "Picnic Area." Similarly, the term "Campground" or "Forest Camp" would seem to imply that it is for overnight camping only. In the western forest regions, a large number of campgrounds are for dual use of camping and picnicking, and often campgrounds have portions of them developed exclusively for picnicking. Probably this fact has led to some confusion among summer tourists when seeing signs reading "Campground," or "Forest Camp." For our purpose here, a "Campground" is defined as an area developed primarily for camping and/or trailer use; a "Picnic Area" is an area developed only for picnicking and/or swimming. The same general principles are used in planning campgrounds and picnic areas, or a combination of these, so unless there is a specific reference to any one of these, the principles can be applied to all three types of areas.

Elaborate facilities and layouts are out of place in forest settings and no attempt should be made to duplicate recreation developments with those found nearer populous areas. As a rule, forest recreation areas are spacious, with the facilities located so that campers and picnickers can enjoy as much privacy as possible. All facilities must serve a definite public need, be pleasing in appearance, and be structurally sound in the interest of public safety and minimum maintenance costs.

Entrance and Interior Roads

The initial sales appeal of any recreation area rests with the attractiveness of the entrance. All areas should be identified by an entrance sign with a sight distance consistent with the normal speed of traffic on the forest road or highway. An average sight distance for high speed highway locations is 300 feet, for forest roads 150 feet. Approach signs up to ¼ mile from entrances are used as a caution to slow down traffic because of the existence of a road intersection, and also to inform the public of the nearness of a recreation area. On fast travelled highways a deceleration and acceleration lane approximately 300 feet in length on both sides of the highway at the entrance should be planned. Centerline turning radius for the entrance and interior roads should be not less than 50 feet. A turning radius of 100 to 200 feet from the highway will often be desired. Width of road, grade, clearing, grading, drainage, and surfacing should conform to minimum specifications for forest roads.

The entrance road, as well as all connecting interior roads where two-way traffic is planned, should conform to one and one-half lane standard for medium logging traffic. The interior roads should be planned in a loop design, topography permitting, for one-way traffic, and should conform to minimum standards for one-lane road for low-service general use. The interior road should be designed generally not closer than 100 feet to lake or stream to allow for camp or picnic spot development between it and the water's edge. Interior roads terminating in a turnaround should be of one and one-half lane standard, with the turnaround of one-lane standard.

Group Picnic Area

The group picnic area generally should be the center of activity in the tract layout. The entrance road should terminate at this point, and the loop road system to the individual camp and picnic units should radiate from this area. The site generally should be level or moderately sloping, and in an open or semi-open parklike timber type, or type capable of being thinned to allow freedom of movement for groups of people. Direct accessibility to the dominant feature of the area such as lake or stream should be planned. The layout design of the facilities within the group picnic areas should be guided by the topographic conditions, cover, and view. Picnic tables generally are 10 feet in length, arranged individually and in groups.

In some forest areas and in areas where rains occur during the nor-

FIG. 2.—A typical picnic unit, Clear Lake Forest Camp, Willamette National Forest, Oregon.

FIG. 3.—Family picnic party, Ocala National Forest, Florida.

mal picnicking season, a stove shelter will often be desirable in the group picnic area. Community kitchens are to be discouraged, other than in heavily used forest camps, in view of the limited use compared to the cost of construction and difficulties of administration. Water should be piped to the area unless a nearby well or spring can provide safe water.

Garbage cans or garbage pits should be provided within the immediate area, and ample parking area laid out. Small camp stoves will often be desirable in the table groups to augment the large picnic stove. A fairly new innovation in picnic area stoves is the use of electric plates. These are rare, however, and are suitable only at a few areas where they are normally installed in the community kitchen. Picnickers can warm up or cook food on the plates for around 10 cents a half hour.

Individual Camp and Picnic Units (Including Trailer Camp Unit)

Each overnight camp and picnic unit is intended to accommodate up to eight persons. The camp unit differs from the picnic unit in that it has a space prepared for a tent, or overnight shelter, and camp units are not usually planned closer than 100 feet from each other. Picnic units may be somewhat closer together. Both units should be provided with parking facilities to accommodate one car singly, and trailer units will require space for a car and trailer.

The camp table generally should be not more than 7 feet in length, and it should be situated to allow ready access to the stove, and to take advantage of views of the lake or stream. Where the use justifies it, a rustic type bench may be included in the plans for either camp or picnic units.

The camp stove should be of low, unobtrusive type which may or may not be convertible to warming fire use. The stove should be oriented with the prevailing winds in order that smoke will cause as little annoyance as possible to the users of the site. Toilet facilities should be planned not further than 300 feet from any camp or picnic unit. Wherever a gravity system is possible, water should be piped to serve an average of 4 units from each hydrant. Garbage and other refuse will ordinarily be taken care of by garbage cans or garbage pits. Care should be taken to see that neither type of unit infringes upon the location for recreation trails planned along the lake shore or streamside.

Sports and Children's Play Area

There is nothing in a forest picnic area that comes closer to duplicating the facilities in a municipal park than a children's play area. Because of maintenance cost and the absence of caretakers in all except a few of the larger recreation areas, playground equipment is furnished only at a few choice locations.

Facilities for children's play areas may include swings, teeters, sand boxes, wading pond, sand beach, etc., planned in a location central to the group picnic area where parental supervision is made easy. The site location should take into account such hazards as roads, deep or swift water drop-offs, and similar factors. Children usually run for the play ground area upon first arriving at the picnic area, as well as after they have eaten. While the parents are preoccupied with arranging the picnic and in cleaning up afterwards, they will want to be able to see that the youngsters are playing in safety. Sports facilities often include horseshoe pitching courts, soft ball grounds, swimming pond in the form of a dammed up stream, bathhouse, diving board, swimming float, bathing beach, and other pertinent facilities. The horseshoe pitching court is usually located in the group picnic area and off to one side for safety reasons. As an addition to the horseshoe court, a shoe storage rack and benches may be provided.

The location of the larger sports facilities is dictated by local conditions. Reasonably close accessibility to the entire camp area is desired. The site location should be studied to avoid undue construction costs and disfiguration of the landscape. Often the grading required for a softball ground or the borrow required to make an earth fill dam defeats the purpose for which the development was intended. For artificial swimming ponds, the planner should consider the maximum depth to be 5 feet, both for reasons of safety and for warmer water. The planner should further explore the possibilities of the development of a series of shallow settling ponds to allow the sun to warm the water before it enters the swimming pond.

Assembly Area

The campfire circle, amphitheater, and community buildings, such as winter sports shelters, have been developed in the past as as-

sembly areas. In general, the campfire circle is accepted as the most popular assembly area development in view of the low cost and informal nature of the gathering. The seating capacity is governed by anticipated or actual use. Large campfire circles and amphitheaters are planned only at large forest camps and picnic areas where picnicking by organized groups is popular and the need for an assembly area is evident. The location is best selected in an area where there is no conflict with other activities in the camp, and where the scenic setting is attractive and noises from streams subdued. It should be reasonably close to the group picnic area; otherwise little use will be made of the campfire circle.

Administration Area

The administration area usually includes a residence and contact station which is manned by an attendant whose duties are entirely or partially recreation administration. Generally there are two locations for the administrator's or attendant's station—at the entrance to the forest camp facing the highway or entrance road, or at a central location within the campground. Either location depends upon local conditions and administrative requirements. Facilities should include signing, public parking, and such service road or court as needed. Often a large rustic type information sign near the entrance to the station will be a silent dispenser of information when the attendant is engaged elsewhere. Design of the station should include facilities for public contact under cover and separate from the living quarters of the building.

Maintenance Area

Most of the larger forest camps need a maintenance area to take care of the many maintenance items that are a perennial problem to the administrative officer. One of the important facilities to be included in the maintenance area plan is the wood storage shelter, or outside wood storage. Additional facilities may or may not include the following: An incinerator for burning the camp garbage and refuse; a storage and equipment repair building where movable tables, garbage cans, and other equipment can be stored through the winter, and facilities made available for repairing broken water pipes, windows, signs, and other damaged articles. The maintenance area should be located off the beaten track of the camp visitor, and in a location resonably close to the attendant's station. The size of the area will depend on the volume of work to be done. This area will often be the central work area for fabricating parts and storage, and assembling of the materials and equipment in the construction of the camp or picnic area.

FIG. 4.—Playground, Ozark National Forest, Arkansas.

Reservoir Area

Source of water supply should be determined early in the development of the camp plan in order that all proposed improvements can be planned with a view to maintain the purity of the water supply. Often the source of supply will be a stream or spring at higher elevation than the camp, where chances of human contamination are remote. Other sources of supply may be points lower in elevation than the camp, requiring a pump or ram to place the water in a tank reservoir at a higher level. Drilling of a well or direct take from a spring in the site may be the only method of obtaining water. Certainly the purity of the water must be maintained at all times and if, by inspection and testing, it is found to be impure or its purity is threatened, remedial action should be taken. This may entail finding a new source of water, installing a chlorination system, fencing the reservoir area, or otherwise eliminating all sources of contamination.

Miscellaneous Improvements

Trails, steps, and benches.—The camp and picnic area should include a well laid out trail system which provides direct access to toilets, garbage pits, etc., and which parallels the lake or stream shore or other scenic attraction. Width, grade, and location depend on the site requirements and public use, and no hard and fast rule is set up here. Popular trails in large camps often may be planned for 6-foot width, with grades exceeding 15 percent designed for steps. Steps, built of cedar or rock, will often solve a difficult trail location and grading problem, and provide interest in the layout. Benches along trails at vantage points or on steep climbs are desired.

Bridges (auto, foot, and horse).—The various types of bridges needed in a camp and picnic area should be a part of the tract plan. Auto and foot bridges are direct results of the design for the road and trail layout. Horse bridges

may be needed in the camp when a bridle trail terminates within the area. The planner should consider the use of culverts and fills instead of bridges wherever possible.

Toilets.—Toilets generally are designed for use by one occupant in a single pit type, and up to six or more in the multiple flush type. Flush type toilets should be planned only at large camps where supervision and maintenance are constant; otherwise the pit type should be selected. Both the pit type and the disposal field for the flush type should be planned not closer than 150 feet from any stream or lake. While it is desirable to locate the toilet in a setting of timber and lesser vegetation, it is by no means desirable to hide it so completely that it has to be hunted out, or place it too far off the beaten track. Past experience seems to bear out the fact that the toilet should be readily seen, with enough vegetative material around it so that it is not too bare or obvious, and closely accessible to the main trail or roads. The number of toilets is usually figured at the rate of one seat or hole to every 40 picnickers, or one to every 25 campers.

Barriers, walls, and fences.—Barriers are designed principally to form a defined area along roadways and parking areas. The camp plan should provide for barriers only at places where unregulated driving will result in harm to the vegetative cover, or to confine parking to restricted areas. Existing natural barriers such as rocks and trees which can become a part of the barrier system should be allowed to remain in place. Barriers frequently will be low, continuous rock curbing, individually placed partially buried rocks, or a combination of a low rock or concrete post with a log rail. Walls, such as a riprap wall, frequently will be needed to form a protective face for a bank to prevent erosion, or a retaining type to hold a graded area. Fences in a forest camp may be desired to form a decorative feature in the administrative area, a boundary fence to keep out livestock, or to serve as a guard rail at hazardous places such as cliffs and waterfalls. The guard rail type of fence must be built for stability and permanence. In this respect, combinations of concrete, rock, pipe, cable, or wire mesh should be considered. Log posts placed in the ground are not desirable for guard rails as they rot out rather rapidly, causing undue maintenance work, and creating possible safety hazards.

Water hydrants and pump stands.—As mentioned previously, water hydrants should be planned to serve an average of four individual camp and picnic units. Hydrants will be needed at stove shelter sites and at the picnic table groups. The combination of drinking fountain and hydrant will often be desirable for both picnic and camp areas. Drinking fountains should be included at such strategic points as junction of trails, at the top of a steep climb, overlook areas, in children's playgrounds and adults' sports areas, at swimming ponds, etc. Where piped water is not feasible, the drilling of a well will be necessary. Pump stands to cover the wells should be located in, or immediately adjacent to, the group picnic area, and should serve six or more camp sites.

FIG. 5.—Information sign, Umpqua National Forest, Oregon.

Garbage disposal.—An adequate distribution of garbage cans or pits in the forest camp will go a long way toward keeping the area clean. Plans should provide for one garbage can to serve two individual camp or picnic units, or one garbage pit to serve four camp or picnic units. One garbage can should serve each picnic table group, and a garbage can should be placed at the stove shelter, bathhouse, fire circle, etc. One or two garbage pits usually will serve the group picnic area, depending on the size of the area. Plans will include a stand for each garbage can. The garbage can and stand should be located as near the camp road as possible to facilitate loading the full cans in a trailer or truck. Both garbage cans and pits should be readily seen by the camper or picnicker so that he will not be inclined to throw garbage in the brush, stream, or in the stove. Garbage cans should be planned for these camps where pick-up can be accomplished at least once every week during the season of use.

Signs.—Camp and picnic area signs generally fall into the following classifications: Approach, entrance, directional, informational, regulatory, and cautionary. Mention has been made previously of some of these, and it is not believed important to discuss the others at

this time. The campground and picnic area plans should include a complete layout of all signs needed. Oversigning, including the use of posters, should be avoided, with particular emphasis on restricting, or entirely eliminating, signs starting with "Don't."

Registers.—Including a registration box or shelter in a forest camp plan will depend upon the local requirements of the site. It should not be considered general practice to include facilities for registration at every forest camp. In fact, they should not be provided unless deemed necessary or highly desirable. Site locations for the register box or shelter may be at the start of an important recreation trail, in the vicinity of the group picnic area or parking area, or at some other point of public concentration. Often an information sign or bulletin board will be all that is necessary and will take the place of a register.

Planting.—Plans should include type and amount of planting to take place. Planting often will be necessary about buildings, signs, cut banks, and fill slopes, at entranceways, along road edges and parking areas, and as screening between camping and picnicking units. Use of native materials similar to those existing in the area should be the rule.

Hunters Camps and Wayside Picnic Areas

The tremendous popularity of big game hunting in recent years has brought some peculiar problems in campground planning. Hunters are gregarious only to a limited extent. They prefer not to camp where there are very many other hunting parties, and consequently seek out-of-the-way places where major camp requirements of fuel and water are available. Because good hunting is often associated with stormy, fall weather, with rains, snow, or frost always a possibility, hunters usually go to the forests fully equipped with camp outfits rather than depend on the availability of facilities found in developed campgrounds. The threat of getting stuck in the snow, or mud, if they get very far away from main traveled roads, has resulted in hunters' frequently using small level spots along the edges of roads for camping. Many such spots are popular because they are near good hunting areas and their limited size precludes their use by more than just a few hunting parties. Unless there are serious fire or sanitation reasons for prohibiting their use, hunters' camps should at least be tolerated, and in some cases encouraged. Usually hunters' camps defy good site planning, but the installation of a well located toilet and garbage pit, and a few mounds of rock to encourage the use of certain spots for warming fires and cooking, are the extent of what should be planned.

It seems that in the last decade or two, more and more people have been packing lunches during their recreation and business travels and, in the absence of developed picnic areas, they have been stopping to eat at whatever convenient places they can find along the edges of highways and roads. As such spots become used more extensively, they take on the appearance of miniature garbage dumps and something has to be done about it. Several of the states have made considerable progress in meeting the situation by developing wayside picnic areas, or parks. These require detailed planning because, unlike hunters' camps, they are used more frequently, and they are situated along highways and heavily traveled roads open to public view and where traffic hazards are involved. The usual wayside picnic area is adequately signed with two approach and one entrance signs. A short loop road or off the shoulder parking strip should be provided and two or three picnic tables, at least one garbage can, and in some cases a pit type toilet should be installed. Overnight camping should be prohibited, and in very few wayside picnic areas should fires be allowed. Plantings of trees and shrubs will provide additional shade and screening.

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Instrument for Determination of Tree Diameters in Inches at Any Height

C. H. Vaux
School of Forestry and Range Management, Colorado A & M College, Fort Collins.

THE EARLIEST DESCRIPTION of a dendrometer found by the author was in Graves' *Forest Mensuration* published in 1906 (*3*). In 1908 the *Forestry Quarterly* published an article describing an instrument to measure log heights (*2*). The comment at the bottom of the page is "A simple attachment for measuring diameters is now called for, signed B. E. F." (B. E. Fernow). In the *Forestry Quarterly* of 1913 (*2*) is a description of an instrument for measuring diameters. It consists of a full sized tripod with a 42-inch metal bar mounted on the tripod. On the 42-inch bar is a small telescope. In the JOURNAL of 1926 (*4*) is an article on use of U. S. Army Signal Corps field glass with mil scale.

The most complex and heaviest instrument of which a description was found was the one described by Clark 1913 (*2*). Regardless of the precision or simplicity of this instrument the main disadvantage is bulk and weight.

The instrument described in Graves' text (*3*) has an adjustable aperture and apparently no magnification. It was found, by trial, that because of lighting conditions and sighting distance, some magnification of the image is essential in a relatively small, compact instrument. However, too high magnification is not desirable. Some instruments do not have the proper optical requirements with respect to instrument scales, regardless of magnification. If one division on the instrument scale gives a value of one unit of space (say an inch) on the object being measured, then 40 divisions on the instrument scale should give a value of 40 units of space (say 40 inches) on the object being measured. Often this is not true[1]. The principle of superimposing one image upon another as in the sextant was tried. This was not satisfactory, first because of optical requirements for the scale, and secondly it necessitated seeing the tree at its base where lighting conditions are often poor or the brush may be so thick that the base may not be seen at all.

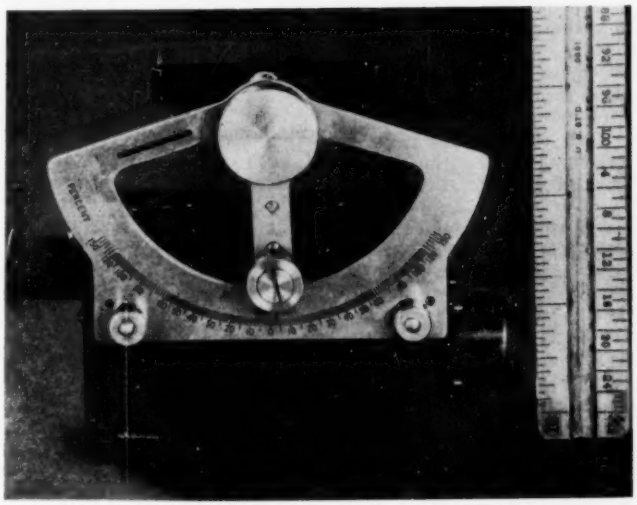

FIG. 1.—Instrument for measuring tree diameters at any height.

Binoculars with a scale etched on glass inside were tried. These had too high magnification, did not meet optical requirements for the scale, and did not measure height without use of a separate instrument (*4*).

Putting a finely graduated transparent scale across the objective end of the Abney hand level was tried. This had too poor optical qualities for general use, because a scale with sufficiently fine graduations was difficult to see; and when magnification was introduced there were other optical blocks.

The instrument, as finally developed (Fig. 1), employs the level bubble and graduated arc as a means of determining the angle of sight above or below the horizontal. In the instrument a scale is seen projected across the diameter of the tree at the point to be measured. The level bubble and projected scale may both be seen at the same time through the same aperture—the eyepiece.

The dimensions of the instrument are 5 by $3\frac{1}{2}$ by 2 inches. It is designed to be carried on a string and hung around the neck, and is small enough to be put in a large shirt pocket. It may be held free in the hand or it may be mounted on a Jacob staff. It is fitted with a ball and socket attachment. For instruction[2] and close use, mounting it on the Jacob staff is advisable. When mounted on the Jacob staff the scale may be read to one half of a division, but when held in the hand this refinement is not possible.

A number of students in the graduating class of 1949 at the Forestry School of the University of Minnesota offered their services in

[1]This is probably due to the fact that all lenses were not properly designed (i.e. corrected).

[2]At large vertical angles the image of the bubble is slightly distorted as in the Abney. By putting the instrument on a staff and setting it at say 150 percent the student may see and study just how the image should appear. If the correct procedure is not demonstrated, as above, the student must learn by trial and error, or he may use the level incorrectly indefinitely.

determining what might be expected from the instrument *when held free in the hand by untrained men*. The instrument was explained to them and they were shown how to measure the diameter at 18 feet above the ground on one tree. Then they measured ten *other* trees at a point 18 feet above the ground. They were told nothing in regard to their measurements until they had finished measuring the ten trees, in order to eliminate bias. The average diameter obtained by ten instrument measurements were compared with the average diameter obtained from ten caliper measurements at 18 feet above the ground. The results are shown in Table 1. The table shows a tendency for the average untrained man to read low.

TABLE 1.—RESULTS OBTAINED IN TESTS WITH INSTRUMENT HELD FREE IN THE HAND BY UNTRAINED MEN (MINNESOTA, 1949). AVERAGE OF ONE READING ON EACH OF TEN TREES. DIAMETER MEASURED AT 18 FEET FROM THE GROUND LEVEL[1]

	Number of men	Difference in inches between caliper and instrument		
	(f)	(d)	(fd)	
	1	.04	.04	
	1	— .07	.07	
	3	— .08	.24	
	2	± .11	.22	
	1	— .14	.14	
	1	— .30	.30	
	1	— .31	.31	
	1	— .32	.32	
	1	— .33	.33	
	1	+ .34	.34	
	2	— .37	.74	
	1	— .38	.38	
	3	— .40	1.20	
	1	— .48	.48	Average
	1	— .51	.51	
	1	— .55	.55	
	1	— .58	.58	
	1	— .60	.60	
	1	— .61	.61	
	2	— .76	1.52	
	1	— .79	.79	
	1	— .84	.84	
	1	— .98	.98	
	1	— 1.14	1.14	
	1	— 1.17	1.17	
	1	— 1.46	1.46	
Total	33		15.86	

[1]At 18 feet from the ground the diameter outside bark ranged from 15 to 25 inches, with the average being 20 inches.

A number of students at the Sophomore Forestry Camp of Colorado A & M College in 1949 offered their services in determining what might be expected from the instrument when held free in the hand by untrained men. The procedure was the same as that used at Minnesota and previously described. The results presented in Table 2 also show a tendency for untrained men to read low.

TABLE 2.—RESULTS OBTAINED IN TESTS WITH INSTRUMENT HELD FREE IN THE HAND BY UNTRAINED MEN (COLORADO, 1949). AVERAGE OF ONE READING ON EACH OF TEN TREES. DIAMETER MEASURED AT 18 INCHES FROM GROUND LEVEL[1]

Number of men	Difference in inches between caliper and instrument	
(f)	(d)	(fd)
1	—0.00	0.00
1	— .07	.07
1	— .08	.08
1	— .10	.10
2	— .12	.24
1	— .14	.14
1	— .16	.16
1	— .17	.17
1	— .24	.24
2	— .27	.54
1	— .33	.33
1	— .35	.35
1	— .46	.46
2	— .47	.94
1	— .48	.48
1	— .61	.61
1	— .65	.65
2	— .73	1.46
Total 22		7.02

[1]At 18 feet from the ground the diameter outside bark ranged from 7.8 to 10.2 inches, with the average being 8.93 inches.

A man with some training measured 100 trees with the instrument held free in hand. The trees were measured by instrument at 18 feet above ground and at d.b.h. They were also calipered at d.b.h and at a point 18 feet from the ground. They were recorded in groups of ten trees. Results are shown in Table 3.

The difficulty with obtaining d.b.h. is caused largely by brush at that level. The diameters at 18 feet are usually above the brush and below the lower limbs; thus this point had good sighting qualities.

Uses of Instrument

To obtain an unknown diameter and given height with a known base. —Any base may be used but graphs are usually constructed for bases of 33 feet, 50 feet, and 60 feet. If a 66-foot base is used the values in the 33 foot graph are doubled. If a 75-foot or 100-foot base is desired the 50 foot graph is used and values increased according to distance. The values are directly proportional to distance and number of units on the instrument scale. As this type of work is frequently done in some fixed unit, such as 16 feet, the vertical angle for the unit of length being used is often marked by red lines on the graph for ease in reading.

The distance for the base is measured from the center of the tree (not the nearest edge) and is done either with a tape, a stick, by pacing, or by eye.

With the base measured, the vertical angle necessary to obtain the given height on the tree is set on the arc. The correct line of sight for the vertical angles is obtained by viewing the bubble on a cross hair line in a manner similar to that used in most instruments for reading such angles. Having determined the point on the tree where this line intersects the trunk,

TABLE 3.—RESULTS OBTAINED WITH 100 TREES BY A TRAINED MAN USING THE INSTRUMENT HELD FREE IN THE HAND

Group	D.b.h. in inches caliper	D.b.h. in inches instr.	Diff. in inches	18 ft. dia. in inches caliper	18 ft. dia. in inches instr.	Diff. in inches
1– 10	22.35	22.30	– .05	20.05	19.79	—0.26
11– 20	23.46	23.80	.34	20.38	20.55	+0.17
21– 30	23.21	23.36	.15	20.27	20.55	+0.28
31– 40	22.58	22.22	– .36	19.87	19.36	—0.51
41– 50	23.39	22.34	–1.05	20.70	20.11	—0.59
51– 60	22.74	22.63	– .11	20.48	20.93	+0.45
61– 70	24.17	23.25	– .92	19.38	19.85	+0.47
71– 80	23.85	23.77	– .08	20.48	20.14	—0.34
81– 90	20.82	21.37	.55	17.97	17.43	—0.54
91–100	22.75	22.72	– .03	19.51	19.03	—0.48
100	229.86	227.76	3.64	199.09	197.74	4.09
Average	22.986	22.776	.364	19.909	19.77	0.409

the number of units on the instrument scale are read which cover the daimeter at that point from edge to edge of the tree.

The image will appear as in Figure 2. For purposes of illustration, only the ten division, and five division, points are shown. Actually there are ten division lines between each ten point in the scale. If the base is 50 feet and the vertical angle is 100 percent the tree at that point has a diameter of 42.3 inches (Fig. 3). This is obtained as follows. Number of divisions on instrument scale = 45. Enter graph on side labelled Divisions on Instrument, at line marked 45. Trace this line vertically to its intersection with diagonal line marked 100 percent. Then note that this point is slightly above the horizontal line marked 42 inches—interpolate visually for the fractions—thus 42.3 inches.

The man who is using a 33 (or 66) foot strip will probably prefer a 33 foot base; the man who uses a fifty-acre plot will probably prefer the 50 foot base and the one who uses a quarter-acre plot will prefer the 60 foot base. Any base may be used. It is recommended that the base should not be less than 33 feet, but 25 feet can be used on very small trees[3]. The larger the tree and especially the greater the height it is necessary to determine, the longer the base must be. The instrument is well suited to the man who estimates by size of average piece or volume of average tree. The middle diameter of the tree will often give the size of the average piece in the tree. The 33-foot base will allow a height measurement of approximately 48 feet; and over an extensive range the merchantable length is under 96 feet. The men who use this middle point of measurement should have a minimum of difficulty due to brush and it will usually be below the lower limbs in most timber suited for lumber. The light conditions at the half way point are often the best, too. Even if these men use their eye for estimating the half-way point and are a little low, the increase in diameter may tend to compensate for shortening the total length; and if a little high, the decrease in diameter may tend to compensate for increasing the total length. The bark thickness at this point often tends to have a more uniform relationship.

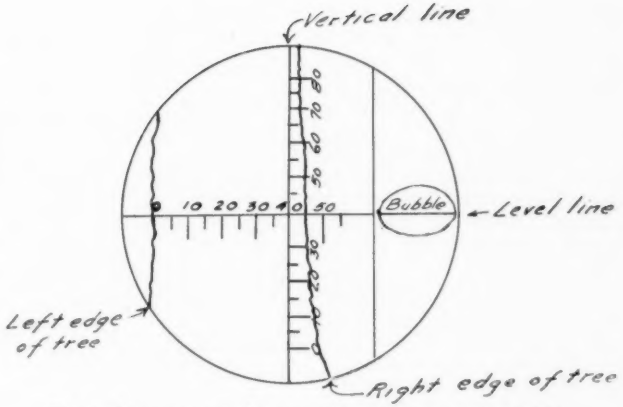

FIG. 2.—Images as seen when measuring diameter at a given height.

Obtaining the percent of taper outside bark of some point on the tree without a measured base.—This type of information is not often desired, but it is possible to obtain under favorable circumstances of brush, etc. Being a purely mathematical relationship between some two points, it is not necessary to determine the value of the diameter in inches, but merely in units on the instrument scale. All readings must be corrected to their value on the level. This is done by use of the graph presented in a previous article on "One Page of Graphic Trigonometry[4]." To use this graph for obtaining diameter relationships with the instrument, the value of the d.b.h. is read level and is say 50 units on the instrument scale. Now say that at a point up the bole of the tree at a vertical angle of 35 degrees 31 units covers the diameter. Enter the graph at the base of the 31-unit point and proceed vertically along this line until it intersects the slanting line marked 35 degrees. This point is on the circular curve that comes up from the 37.8 unit point. Thus 30 units at 35 degrees is the same space as 37.8 units on the level. The diameter relationship is as 37.8 is to 50 or .756. This correction for the space (diameter) covered by units will hold regardless of length of base.

It should be clearly understood that this method of obtaining percentage relationship between the diameters at different points on a tree holds only under certain conditions: The tree must be comparatively vertical and the instrument being used must have the proper optical attributes.

Summary

1. When the instrument is mounted on a Jacob staff, any careful operator can obtain diameter measurements at any visible point on a tree with sufficient accuracy for the majority of purposes for which such measurements are used.

2. When the instrument is held free in the hand, a skillful operator can obtain diameter measurements at any visible point on a tree with accuracy sufficient for most purposes for which such measurements are used.

3. Most men can be trained to use the instrument with sufficient accuracy to obtain diameters at any visible point with an accuracy sufficient for purposes of timber esti-

[3]Fundamentally a wedge is being used to obtain the diameter of a circle. If the wedge is sufficiently long the practice is sound; but if too short, with relation to diameter of circle, the error is appreciable. In the instrument, most of this has been taken care of by certain limitations in the field of view.

[4]Vaux, C. H. One page of graphic trigonometry. Jour. Forestry, 49:339. 1951.

mating. They may be trained to obtain diameters at upper points on the bole of a tree much more accurately (and easily) than the average man can be trained to do so by eye.

4. Once trained a man may lose the ability to estimate quickly by eye or he may be shifted to unfamiliar timber. The instrument will bring him back into training quickly and easily.

5. If 50-foot base diameter correction chart is placed back to back with a degree graph (*4*) there is on one page (two surfaces) sufficient information to make most of the computations needed in rough surveying and accurate diameter determinations over a very wide field of possibilities.

6. The instrument has definite limitations which are shown clearly by the graphs and experimental data presented. It is not designed for stadia measurement but can be used with reasonable accuracy up to approximately 200 feet.

7. The instrument will perform the usual functions of the Abney hand level.

8. The instrument can be used for running levels when mounted on a Jacob staff. However, it is not designed for such refined work as giving cut offs on long pile trestles.

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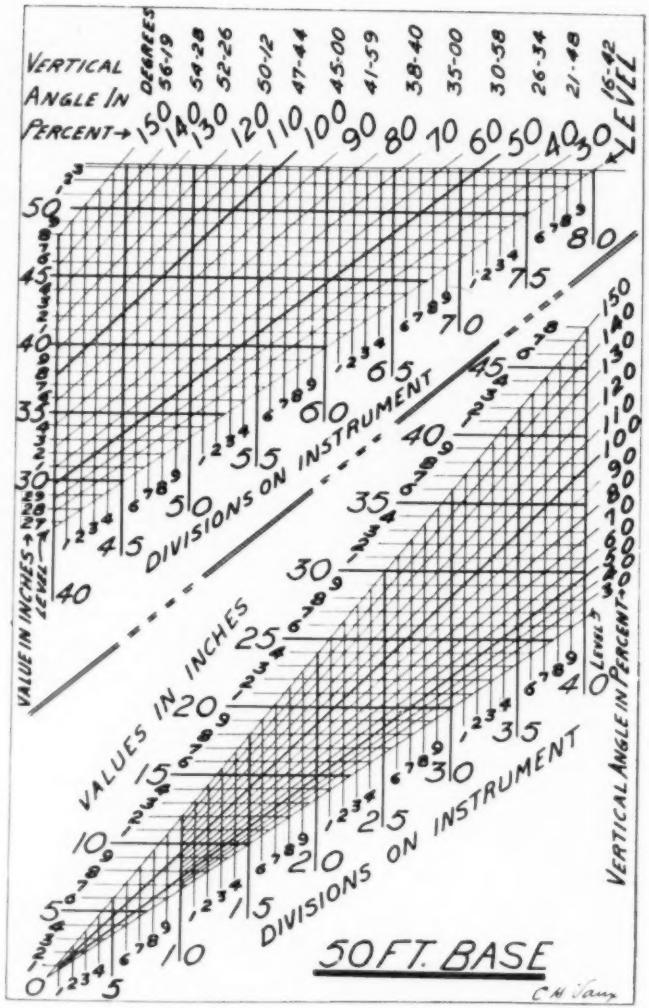

FIG. 3.—Graph for use with 50-foot base. Because of the ease with which this can be converted to other base distances this is probably most universally acceptable graph. For other base: 25 feet = .5 value; 30 feet = .6; 40 feet = .8; 60 feet = 1.2, etc.

Forest and Shelterbelt Planting in the United States—1951[1]

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Forest and shelterbelt tree planting by all individuals and agencies during the planting year 1951 (July 1950 through June 1951) amounted to 456,368 acres—a decrease of 41,100 acres or 9 percent from the 1950 figure. The year's accomplishment by ownership classes is as follows:

The federal government planted about the same amount on federal lands as it had the previous year.

The states and other public landowners (non-federal) planted 11 percent fewer acres this year—a decrease of 5,400 acres.

Private landowners planted 10 percent fewer acres this year—a decrease of 36,300 acres.

In 17 states, private land planting decreased 79,000 acres or 44 percent mostly because of lack of planting stock rather than for want of the wish to do planting.

In 10 states private land planting remained at about the same level.

In 23 states private land planting increased 43,000 acres, or 35 percent.

FOR THE NATION as a whole we are just now returning to the rates of reforestation achieved before the start of World War II. The banner year of planting was 1940 when a planting of 519,000 acres was reported by everyone combined. The second highest year was 1938 when 505,000 acres were reported. Other high-achievement years were 1950 with 497,000 acres, 1939 with 481,000 acres, 1941 with 474,000 acres, and 1936 with 414,000 acres.

In the five years before the war, 1937-41, the reported planting totaled 2,267,000 acres, which is an average of 453,400 acres a year. No reports were collected in 1942-43-44, but planting fell off so much that when reporting was resumed in 1945 only 140,000 acres were shown as that year's progress. The discontinuance of the large federal land planting programs and diminished nursery capacities during the war reduced the amount of planting so much that in the following five year period of 1945-49 only 1,168,000 acres were reported—an average of but 234,000 a year. It was not until 1950 that the pre-war rate was again achieved. We have yet to equal "Record Year 1940."

A most important shift has come about in who is doing the planting today versus who was doing it ten or fifteen years ago. The contrast is shown below:

Year	Federal acres planted	Other public acres planted	Private acres planted	Total
1940	175,000 (34%)	90,000 (17%)	254,000 (49%)	519,000 acres
1951	51,000 (11%)	44,000 (10%)	361,000 (79%)	456,000 acres

Programs

In those banner planting years of 1936 through 1941 there was a vast program of direct government planting financed largely with federal unemployment relief funds and working on both publicly and privately owned lands. The Civilian Conservation Corps was at work, the Shelterbelt Project was under way in the Prairie States, and tree planting as a source of employment was undertaken by various relief agencies. In contrast, the cooperative programs under which a landowner is helped to get trees but must plant them himself were not so important a part of the whole effort. For example, the Pittman-Robertson program was newly started, and the Clarke-McNary program (C-M 4) of cooperative tree distribution was restricted to furnishing trees to farmers alone —other forest landowners were not eligible to get such trees (although a number of the states did, nevertheless, furnish such trees without federal help).

Today there is no tree planting for unemployment relief, and planting by the private owner with cooperative assistance is the accepted practice. To elaborate—the state foresters' organizations have been strengthened, enormously in many states, and their C-M 4 work increased accordingly. (Now C-M 4 trees are available to all forest land planters, not to farmers only.) In addition to C-M 4 and generally in cooperation with it, there is the help extended to private landowners by the Soil Conservation Service which vigorously fosters tree planting; the PMA's Agricultural Conservation Program which will help an eligible landowner by bearing a part of planting costs; and the Pittman-Robertson Wildlife Restoration program which is encouraging sportsmen to plant trees for wildlife habitat. There are also the flood control agencies and the Tennessee Valley Authority which are important in their specific localities. State extension foresters work hard at the job. Vigorous promotion campaigns privately financed by businessmen's groups, railroads, forest industries apart from their own lands, and service clubs are very effective in widespread parts of the country. These together have raised private planting nearly enough to offset the decrease in direct public planting.

Nursery Facilities

Federal.—With the decreased planting on federal lands a number of federal nurseries have been closed. For example, the Indian Service no longer operates any nurseries, and since 1940 the U. S. Forest Service has dismantled or leased to states or private owners 13 of its nurseries and has returned to private owners those it had leased for the Shelterbelt Project. The TVA and the SCS also operate nurseries (12 in 1951 that were important

[1]Compiled from information furnished by the state foresters or other appropriate public officials of each state and federal agency concerned.

producers of trees)—the stock from them going mostly onto private land. The total output of trees from these nurseries is being gradually reduced as work loads shift.

State.—In 1940 the states produce 200 million trees in 84 nurseries. In 1944 this had shrunk to 59 million trees from 73 nurseries. In 1951 it has risen to 307 million trees and 83 nurseries. Equally, or even more important than the increase in the number of nurseries, is the great improvement in their management. Many of the 1940 nurseries were small, poorly organized units; today these nurseries are larger and better managed, and are producing better stock than in 1940. Since the success and expansion of the nation's reforestation effort will probably come mostly from the state foresters' nurseries, this advance is an important one.

Despite this expansion of production, however, in many places demand greatly exceeds supply, perhaps by as much as 60 million trees in 20 states. One of the biggest producers could fill only 45 percent of its orders. There is an effort to use all facilities to the utmost, and 21 states report trading stock among themselves, buying stock as available from commercial nurseries, and making long-term contracts for future delivery with other state, federal, and commercial nurseries. Seven of the states are building nine new nurseries and closing two, and twelve are expanding nurseries. When all these nurseries are built and enlarged, their total capacity will approximate 500 million trees a year. Lest this look like an abundant supply, it is pointed out that if the private land planting job is 62 million acres as is claimed, such a production amounts to 0.8 percent a year.

Commercial and industrial.—Some of the commercial nurseries are actively seeking "conservation stock" business and are expanding production as firm contracts warrant. Also, we know of ten forest products companies operating nurseries with an annual output of 25 million trees with others scheduled if necessary to get planting stock beyond state nursery capacities.

Advances in Techniques

Nursery.—The pressure of labor shortages and advancing cost of materials and services has forced the adoption of new methods so much that in the past decade nursery operation has been revolutionized. The discovery of chemical sprays which kill weeds without affecting the trees has so reduced the need for people to do hand weeding that huge nurseries have been built in localities of limited population. Power machinery has largely replaced hand methods and the horse in preparing land, shaping beds, spraying, digging, and packing. Improved soil management and growing techniques have helped many states to grow seedlings of transplant vigor so that some states which once produced mostly transplant stock are now producing only seedlings with consequent increase in production and saving in cost.

Planting machines.—Along with the advances in nursery practices there has also come advance in field planting techniques, especially in the use of tree planting machines. There are now so many planting machines in use that it seems impossible to estimate their number. In addition to the many home-made ones, there are the commercial machines of at least 19 manufacturers who offer 30 different models at prices ranging from $200 to $800 apiece. Machine capacities exceed 1,000 trees per hour under normal conditions. Hand planting, of course, is still in general use on difficult mountainous sites, on irregular and small tracts, and in places where no machines are available. Mention must be made of the contribution of the past two or three years made by many service clubs, banks and businessmen's associations, forest product companies, and state agencies buying such machines and lending them free or at minimum rates to private users. A great increase in the number of machines is forecast, and this will cheapen and stimulate planting accordingly.

Direct seeding by airplane.—Techniques of sowing seed directly from airplane and helicopter are now developed to a point where they are being used on at least an "extensive pilot plant" basis in the Pacific Northwest and the South. The success of such seeding is earnestly hoped for by all. However, the reports do not show much acreage planted in this manner. Apparently the state foresters are hesitant to report much of this kind of planting until they can make a more accurate appraisal of success.

Other Factors in the Tree Planting Effort

The success of a reforestation program can only be measured by the amount of wood sent to harvest years hence. Yet, in some places people have overlooked this, subordinating the importance of seed origin, species-site correlation, and field planting techniques to their efforts to increase the number of trees shipped.

Seed.—The greatest need for improvement in these respects has been in seed—in growing nursery stock from seed of the same provenance as the proposed planting sites. It is gratifying to report a considerable awakening among the tree planters and definite physical progress here, especially during the last two years. Many state nurseries now have good inventories of locally collected seed in refrigerated seed storage vaults and more and more states are collecting seed from within their own boundaries. One state has developed so good a seed source from a superior plantation of Scotch pine that it plans no longer to buy seed from Europe. Seed orchards have been established in a few places. Some of the commercial seed dealers are paying scrupulous attention to certifying seed origin. For only a reasonable premium they will furnish seed of guaranteed strains and seed from superior specified tracts in specified townships. But the picture is not everywhere so rosy and much more remains to be done before all the planters are getting stock of superior parentage.

Planting sites.—Adequate training and guidance in helping the

TABLE 1.—SUMMARY OF ALL ACRES PLANTED IN 1951

(July 1, 1950-June 30, 1951)

State	Federal acres planted			Other public (non-federal) acres planted			Private acres planted			Grand total		
	Current year	Previous years	Total	Current year	Previous years	Total	Current year	Previous years	Total	Current year	Previous years	Total
Alabama	3,545	60,894	64,439	383	2,742	3,125	15,041	81,894	96,935	18,969	145,530	164,499
Arizona		5,491	5,491	—			328	1,016	1,344	328	6,507	6,835
Arkansas	733	18,928	19,661	43	69	112	11,472	36,753	48,225	12,248	55,750	67,998
California	3,669	33,505	37,174	2	15	17	279	36,506	36,785	3,950	70,026	73,976
Colorado	780	67,569	68,349	14	30	44	950	19,434	20,384	1,744	87,033	88,777
Connecticut	—	650	650	63	14,087	14,150	598	22,808	23,406	661	37,545	38,206
Delaware		100	100	19	548	567	126	1,525	1,651	145	2,173	2,318
Florida	703	26,923	27,626	593	4,091	4,684	22,937	200,206	223,143	24,233	231,220	255,453
Georgia	207	10,072	10,279	643	5,054	5,697	39,363	251,581	290,944	40,213	266,707	306,920
Hawaii				299	34,791	35,090	363	60,738	61,101	662	95,529	96,191
Idaho	1,351	95,484	96,835	46	473	519	486	7,211	7,697	1,883	103,168	105,051
Illinois	2,137	35,381	37,518	690	6,480	7,170	2,881	41,531	44,412	5,708	83,392	89,100
Indiana	1,428	14,673	16,101	1,784	17,794	19,578	4,965	45,715	50,680	8,177	78,182	86,359
Iowa	—	142	142	95	6,875	6,970	439	260,287	260,726	534	267,304	267,838
Kansas	—	100	100	—	560	560	1,500	216,779	218,279	1,500	217,439	218,939
Kentucky	245	10,325	10,570	63	958	1,021	1,932	14,684	16,616	2,240	25,967	28,207
Louisiana	—	103,419	103,419	1,310	5,123	6,433	51,771	168,993	220,764	53,081	277,535	330,616
Maine	—	401	401	54	939	993	524	17,272	17,796	578	18,612	19,190
Maryland	—	1,431	1,431	422	2,664	3,086	1,048	22,360	23,408	1,470	26,455	27,925
Masachusetts				136	61,167	61,303	623	32,941	33,564	759	94,108	94,867
Michigan	6,721	529,400	536,121	9,041	291,118	300,159	17,335	84,072	101,407	33,097	904,590	937,687
Minnesota	2,449	129,148	131,597	1,773	45,850	47,623	2,097	94,232	96,329	6,319	269,230	275,549
Mississippi	4,471	132,136	136,607	194	2,950	3,144	25,162	85,636	110,798	29,827	220,722	250,549
Missouri	2,342	52,903	55,245	241	3,610	3,851	901	16,483	17,384	3,484	72,996	76,480
Montana	773	33,803	34,576	—			665	10,266	10,931	1,438	44,069	45,507
Nebraska	8	30,622	30,630	—	1,446	1,446	6,850	276,803	283,653	6,858	308,871	315,729
Nevada	—	42	42	—	—	—	31	261	292	31	303	334
New Hampshire	—	1,153	1,153	54	12,256	12,310	931	24,136	25,067	985	37,545	38,530
New Jersey				97	13,352	13,449	1,123	24,189	25,312	1,220	37,541	38,761
New Mexico	60	5,509	5,569				219	1,606	1,825	279	7,115	7,394
New York		5,183	5,183	5,920	479,137	485,057	29,113	285,098	314,211	35,033	769,418	804,451
North Carolina	1,431	13,873	15,304	258	3,465	3,723	9,572	52,318	61,890	11,261	69,656	80,917
North Dakota	2	2,445	2,447	2	305	307	5,108	60,693	65,798	5,112	63,440	68,552
Ohio	996	10,928	11,924	1,315	25,727	27,042	7,428	81,863	89,291	9,739	118,518	128,257
Oklahoma	529	4,673	5,202	37	346	383	2,602	80,247	82,849	3,168	85,266	88,434
Oregon	6,161	56,081	62,242	3,775	16,206	19,981	3,948	39,346	43,294	13,884	111,633	125,517
Pennsylvania	56	20,832	20,888	1,462	80,292	81,754	13,380	205,962	219,342	14,898	307,086	321,984
Puerto Rico	204	11,169	11,373	1,053	17,998	19,051	2,033	53,830	55,863	3,290	82,997	86,287
Rhode Island		403	403	312	7,055	7,367	350	20,140	20,490	662	27,598	28,260
South Carolina	1,188	30,764	31,952	1,069	14,640	15,709	18,419	150,814	169,233	20,676	196,218	216,894
South Dakota	737	28,919	29,656	288	1,933	2,221	6,696	70,363	77,059	7,721	101,215	108,936
Tennessee	1,443	51,613	53,056	580	22,275	22,855	4,736	153,347	158,083	6,759	227,235	233,994
Texas		49,669	49,669	684	2,118	2,802	18,954	85,751	104,705	19,638	137,538	157,176
Utah	14	3,982	3,996	14	34	48	217	1,551	1,768	245	5,567	5,812
Vermont	168	1,107	1,275	106	7,154	7,260	1,114	21,808	22,922	1,388	30,069	31,457
Virginia	79	5,738	5,817	99	2,413	2,512	4,749	24,440	29,189	4,927	32,591	37,518
Washington	3,725	87,478	91,203	1,121	35,978	37,099	5,783	74,767	80,550	10,629	198,223	208,852
West Virginia	259	15,824	16,083	104	2,711	2,815	1,842	18,397	20,239	2,205	36,932	39,137
Wisconsin	2,125	227,152	229,277	7,686	166,722	174,408	11,754	137,039	148,793	21,565	530,913	552,478
Wyoming	246	6,314	6,560	—	136	136	701	4,602	5,303	947	11,052	11,999
Total	50,985	2,034,351	2,085,336	43,944	1,421,687	1,465,631	361,439	3,780,291	4,141,730	456,368	7,236,329	7,692,697

landowner to select the proper species for his sites and in handling and planting the trees so they will live is given as a major need by some states. Six states reported organizational changes planned or made to improve this phase of the work this year. Additional emphasis on this is needed generally.

States in the Cooperative C-M 4 Program

California and Rhode Island joined the program on July 1, 1951, bringing to 45 the number of states and territories participating. Those not now participating are Nevada, New Mexico, Arizona, Minnesota, and Kansas. Landowners in Nevada, however, regularly get the small quantities they require from Utah, and orders from New Mexico will be filled by Colorado. Minnesota distributed 3½ million trees last year but preferred to do this outside the C-M 4 Program. Kansas withdrew from the program a few years ago.

Response to Release of Ponderosa Pine in Central Idaho

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Ponderosa pine is the most common and most valuable commercial timber tree in central Idaho. Indeed, for the entire United States, it is second only to Douglas-fir in volume of sawtimber on commercial forest land. Unfortunately there has been little research work done in this part of the species range which can be used by the manager of this important and pure forest type.

IN ANY MANAGED FOREST STAND, growth, mortality, amount of reproduction, stand structure, and soil stability can all be substantially influenced by the removal of certain components, and this, in turn, will depend on the way in which a stand is marked for cutting. In regions where growth per acre is low the silviculturist strives to mark for the production of maximum growth of all trees which remain after cutting. This is not always easy, particularly in making the first cut in virgin stands and where insects are the chief cause of mortality. Nevertheless, by knowing how different classes of trees will perform after a cut is made, the marker is better equipped to reach a decision in the many individual alternatives he must face.

The ability of ponderosa pine to respond to release is well documented in several reports. Some of the more important conclusions of these reports are: "Trees growing at a slow rate as indicated by small crowns, flat tops, etc., may show a greater relative response to cutting than trees of vigorous appearance but the absolute rate attained is seldom as high as that of the latter trees" (*1*); ". . . the growth response is induced by reducing competition for soil moisture more than by an increase in light" (*2*); ". . . accelerated growth results rather from an increased amount of water than from an extension of crown growing space" (*4*); "The lesson is that growth can be increased by cutting, almost without regard for crown size above (Keen) Class D" (*5*).

Wadsworth (*6*) studying growth after release of small-crowned and suppressed trees classified as 3C, 4C, 3D, and 4D in the Southwest, found that growth rates increased markedly after release and that the rate of growth, for healthy trees, is more closely related to environment than to crown size or age. He found this increased rate of growth persisting after 30 years.

It is enlightening to know the extent to which trees of different tree classes will respond, particularly if release is substantial. Commonly in ponderosa pine stands the small-crowned, suppressed individual is a poor-looking specimen and yet, because of its growing conditions, it may have developed a clear bole for one or two log lengths. They are commonly of diameters intermediate between the abundant, overmature sizes and the younger, unmerchantable poles, and thus will contribute to future cuts a greatly needed size class. If such trees are capable of good growth following release, this alone is sufficient reason for considering them as acceptable components of the reconditioned stand. This reasoning should, of course, be tempered by the knowledge that such trees must be physiologically sound and that, in central Idaho at least, insects must be considered the chief cause of mortality. Unless the latter fact is appreciated by the marker, he cannot make his choices in a completely effective manner.

The following analysis and discussion deals with measurements taken on 88 ponderosa pine trees remaining in a stand that had been cut in 1933, 15 years previous to measurement, and 20 trees in a virgin stand, in an effort to determine the nature and extent of release in immature, mature, and overmature ponderosa pine of low vigor (Keen classes 2C, 2D, 3C, 3D, 4C, and 4D). The following data were recorded: Keen class at time of measurement, estimated Keen class at time of cutting, d.b.h., radial growth at d.b.h. for 15 years before cutting and 15 years afterward, height, clear length, stump diameter, and diameter, distance, and direction of other stumps and uncut trees within 25 feet of the measured tree. Where any question of age existed in estimating tree class the tree was bored to determine the age. Sample trees in the virgin stand were measured as a check against the possible effect of favorable local climate which could have produced increased

growth in diameter after cutting. All sample trees were chosen at random and those in the virgin stand were individuals next to 3D's, 4C's, and 4D's—trees which would have been removed in any harvest cutting and consequently would release those measured.

Results

In a preparatory comparison, a "t" test revealed that there was no significant difference in average diameter growth between trees on the two study areas before cutting.

For the trees in the virgin forest, 2 out of the 20 measured showed a slight increase in diameter growth during the second of the two 15-year periods; the other trees showed a decrease. For the trees in the cut-over area, from which about 80 percent by volume had been removed, 4 trees showed a decrease in growth after cutting and 84 showed an increase. Average diameter growth of all trees in both areas was:

	1919-33	1934-48
	Inches	*Inches*
Virgin forest	.52	.46
Cut over	.68	1.80

If sufficient release is provided by cutting in a stand, the trees will tend to move from one Keen vigor class as of the time of cutting to the next higher class. In general, the younger the trees within each vigor class the more pronounced will this trend be for a given length of time. This trend is reversed for an uncut stand. After the second cut in a managed stand, it is likely that Keen classes 4A, 4B, 4C, 4D, 3D, and some 2D's will have been removed. There should also be a tendency in a managed stand for a decrease in the number of D's, an increase in the number of A's, and a net increase in C's and B's. Table 1 shows diameter growth before and after cutting for the two 15-year periods and the upward movement in vigor classes B, C, and D by Keen tree classes estimated as of 1933 and 1948.

Table 1 shows that in each Keen class there was an increase in diameter growth for the 15-year period following cutting. Growth before and after cutting was least in the low vigor classes and old age classes with few exceptions. Interesting also is the superior growth of released trees of any given class compared to the next higher vigor class or next lower age class before release. This result appears to substantiate the evidence of other investigators and to emphasize that, provided a tree is physiologically sound and supports some green crown, the increased soil moisture available is responsible for increased growth even on trees of apparent poor vigor. The difficulty arises in recognizing a physiologically sound tree.

TABLE 1.—AVERAGE DIAMETER GROWTH OF PONDEROSA PINE DURING 15-YEAR PERIODS BEFORE (1919-33) AND AFTER CUTTING (1934-48) IN RELATION TO KEEN TREE CLASSES[1]

Vigor classes and growth periods	Age classes							
	1933 Keen class				1948 Keen class			
	1	2	3	4	1	2	3	4
		Inches				*Inches*		
A								
Before cutting	—	—	—	—	—	—	—	—
After cutting	—	—	—	—	—	—	—	—
(No. trees)	—	—	—	—	—	—	—	—
B								
Before cutting	—	—	—	—	—	.93±.16	.77±.10	—
After cutting	—	—	—	—	—	2.79±.26	2.23±.37	—
(No. trees)	—	—	—	—	—	11	9	—
C								
Before cutting	—	.94±.17	.88±.13	.66±.14	—	.59±.09	.77±.10	.57±.08
After cutting	—	2.56±.28	2.31±.26	1.28±.24	—	1.51±.22	2.11±.24	.86±.06
(No. trees)	—	11	19	5	—	14	24	5
D								
Before cutting	—	.51±.07	.56±.06	.50±.12	—	.42±.06	.51±.08	—
After cutting	—	1.63±.21	1.55±.18	.86±.23	—	1.31±.03	1.19±.15	—
(No. trees)	—	19	28	3	—	6	14	—
Total no. of trees	—	30	47	8	—	31	47	5

[1]Data for classes having less than three trees not included. Keen classes for 1933 estimated in 1948.

Analysis of the data for the growth-study trees showed that the percentage increase in basal area at breast height of residual trees in relation to the percentage of basal area removed within a radius of 25 feet will take the form illustrated in the upper part of Figure 1. A theoretical "minimum" was calculated to show the basal area increase in percent if the diameter growth after cutting had been the same as the diameter growth before. This assumed growth is shown in the lower part of Figure 1. The values between the two indicator lines may be considered the percentage of basal area increase due to release only.

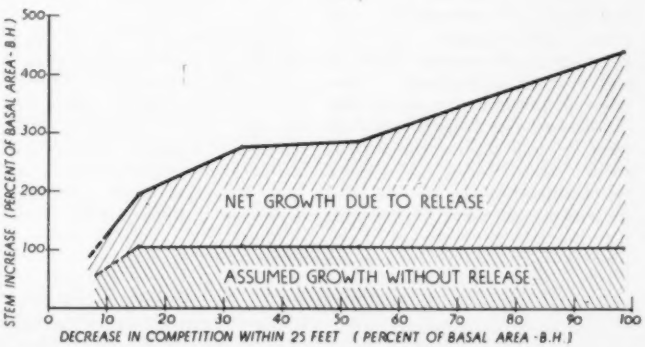

FIG. 1.—Net growth of ponderosa pine due to release (upper shaded portion); based on a sample in central Idaho in which net growth is the difference between gross growth and the growth which would have accrued if there had been no decrease in competition.

To learn what possible effect precipitation for the growing season, April through August, had on growth during the periods in question, records for Idaho City (3 miles from the study area) were examined. There was an increase in the total precipitation for the period after cutting of 10.0 inches compared to the period before cutting, or, there was 7.37 inches deficiency for the first period and a 2.63-inch excess for the period following cutting. It appears unlikely that an increase in seasonal precipitation is alone responsible for the growth increase in the cutover area, since the growth rate in the adjacent virgin stand decreased in the second period.

It was found that where there was 100-percent release within 25 feet of a tree, the ratio of diameter growth after release to diameter growth before could be expressed as the following simple linear regression equation: $y = 7.2581 - .2393x$ where y is the ratio of diameter growth after release to that before release and x is diameter breast height at the time of release. This relationship holds for trees up to and including 30 inches d.b.h. The "t" value of the curvilinear coefficient lay between the 5- and 10-percent level of probability for the 44 degrees of freedom.

Percentage diameter increase for individual trees varied widely from 7.1 percent for a 1C to 1,500 percent for a 3D; this increase exceeded 100 percent for more than two-thirds (69 percent) of the trees. Likewise, there was wide variation in the amount of crown and the extent of release. Trees released by removal of stems close to them grew at a faster rate than trees released by cutting further away. There was a very distinct relationship between the increase in growth rate after release and the number of sides of the tree released, as shown in Table 2.

In ponderosa pine, development of clear length proceeds very slowly. Trees of Keen classes 2 and 3, and occasionally 4, which have a clear length of 10 feet or more and are considered to be physiologically sound, should be favored for retention, provided the highest insect-risk trees have been removed. The average clear lengths by Keen classes are given in Table 3.

It can also be seen that clear length increases with decreasing vigor, which is what would be expected in crowded, suppressed individuals, a relationship found earlier by Maki (*3*). The number of trees in age class 4 is insufficient to sustain the trend which is evident between age classes 2 and 3.

TABLE 2.—DIAMETER GROWTH AFTER RELEASE IN PERCENT OF DIAMETER GROWTH BEFORE RELEASE BY NUMBER OF SIDES RELEASED

Sides released	Number of trees	Diameter growth
		Percent
1	34	136
2	40	149
3	11	275
4	3	462

TABLE 3.—CLEAR LENGTHS BY KEEN TREE CLASSES

Age class	Vigor class A	B	C	D	
		Feet			*No. trees*
1	—	—	—	—	—
2	—	13.5	14.9	17.0	31
3	—	16.6	17.3	19.4	46
4	—	—	16.5	17.2	7

Summary

Data relating to the growth of 88 residual ponderosa pine trees in a stand that had been cut 15 years previously in central Idaho were collected and analyzed in 1948. These were compared with data on 20 trees of similar diameter and Keen tree class range in an adjacent uncut drainage for the 15-year periods before and after cutting.

There was no significant difference in rate of growth before cutting between the trees in the cutover area and those in the virgin stand. For the period after cutting, however, 84 of the 88 substantially released trees in the cutover stand classified in Keen classes 2B, 2C, 2D, 3B, 3C, 3D, 4C, and 4D showed a considerable increase in rate of growth. During this period, only 2 of the 20 measured trees in the virgin stand showed a slight increase; the others showed a decrease.

Increases in diameter of trees in the cut-over stand for the second period varied between 7.1 and 1,500 percent. Sixty-nine percent of the trees increased in diameter by more than 100 percent. The increase in diameter growth is attributed largely to release, that is, decrease in competition.

This study shows that where there is 100-percent release within 25 feet of a tree, the simple linear regression equation $y = 7.2581 - .2393x$, where x is the diameter breast high in inches (up to 30) at the time of release, expresses the ratio of diameter growth after release to that before release (y).

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Measuring the Unused Wood Resources of Washington

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The leavings of the forest industry in Washington accumulate at the rate of 210 million cubic feet every year. The quantity was revealed by the Washington Institute of Forest Products upon completion in 1951 of its state-wide inventory of unused wood. Knowledge of the locations and concentrations of the inexpensive resource is motivating expansion of the state's wood-using industries. Improved handling methods and favorable markets are encouraging the utilization of a material that in the past would not pay its way out of the woods.

A description of the methods and standards used by the Institute to "cruise" the leftovers is prepared here to assist other foresters in making similar inventories in their own areas. Additional information may be obtained from the Washington Institute of Forest Products, 303 Anderson Hall, University of Washington, Seattle 5.

REDUCING A STANDING TREE to a series of useful commodities produces much nuisance wood of little apparent value. The material develops all along the line from forest to consumer in the form of broken and defective logs, small knocked-down trees, chunks, bark, sawdust, shavings, trim, and short or low-grade lumber.

To help close the gap by utilization between what we cut and what we grow, the governor, legislature, and forest industry of Washington embarked on an inventory to determine the character and extent of unused wood resources of the state. Some intensive studies have been made in the past which indicated the amounts of unused wood left over after logging (*2, 4, 5*). This inventory represents the first detailed state-wide attempt to determine the volume of unused wood developed annually in logging and primary manufacturing. The wood available annually as intermediate cuttings from young stands was estimated also.

To facilitate the study, the state was divided into 12 economic districts based on the direction of log flow, timber types, location of transportation routes, market areas, and shipping points.

Inventory Procedure and Standards

Cut-over land.—Basic data pertinent to the inventory of logging residuals were collected from records of the State Division of Forestry, the U. S. Department of the Interior, the U. S. Forest Service, county assessors, and individual timber operators. They included the acreage logged, the volume removed, legal description, and timber type for each area logged during the base years. The new timber type classification of the forest survey was employed in classifying the plots.

Training the inventory crews was the first step. Practical demonstrations were given in scaling and grading by a professional scaler. After proficiency was obtained, the staff was divided into two-man crews and the members were rotated from party to party to achieve uniformity in procedure. One man would record the plot data while the second man would measure and classify the leftovers and on the next plot the men would exchange duties. This tended to balance out any discrepancies which might occur if one man did all the measuring and classifying.

During the field season of 1949, plots were run on every large operation in each district covered. The field supervisor was familiar with these operations and plots were sampled on areas logged in 1948. The crews tried to get as many plots on the operations as possible in the selected districts.

The crews worked in three-man parties the second summer because it was found that the note keeper was idle part of the time when only one man measured and classified the leftovers. As before, members rotated from duty to duty and from party to party. On the first day of each week the crew leader would start his two-man crew in an area running plots and would then scout the settings to be sampled on succeeding days. After scouting the areas the crew leader would return to his men and assist them in speeding the collection of plot data.

The plots to be sampled during the 1950 field season were selected on a random sampling basis because it was learned that in some timber types more plots had been taken the previous summer than were actually needed to come within the desired accuracy (plus or minus 15 percent standard error of the mean). The predicted number of plots was computed on the basis of the variability of the plots sampled during the previous field season.

The field crews followed a standard procedure in laying out half-acre plots 5 chains long by 1 chain wide (330 feet by 66 feet), using a hand compass, trailer tape, and Abney level. The plot boundaries were marked by red cruiser tags or stakes and the tallying was done systematically within the area. The plot strip lines were run diagonally across the setting at an angle with the contours to cross ridges and valleys and distribute variations in slash accumulation. The plots were spaced at 5-chain intervals, landings excluded. To reduce personal factors that might affect the selection of strip direction within the limitations set forth, the actual compass direction had to be a multiple of 20 degrees. Of each setting sampled, 3 to 4 percent of the area was covered.

The material was classified in use-quality classes in accordance with existing commercial standards. In any doubtful cases, items were dropped into the next lower

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FIG. 1.—Cedar logging residuals cold decked to the A. R. Decker Shingle Mill, Elma, Wash.

FIG. 2.—Woodpeckers at sawmill slab conveyor selecting suitable manufacturing refuse to chip for pulp.

quality-use group. Every piece of material falling within a specified use classification was tallied if the large end lay within the plot. It is significant to note that only sound stem wood was tallied. Final volume figures included no decayed material, limbs, or roots.

The use classifications were as follows:

Peeler logs.—Minimum size: 24 inches by 16 feet.

Peeler blocks.—Minimum size: 24 inches by 102 inches.

Saw logs.—Minimum size: 8 inches by 8 feet in bucked length.

Fiber wood.—Minimum size: 4 inches by 4 feet.

Poles.—Minimum size: 4 inches diameter at small end by 16 feet.

Standing trees and snags.—Tallied by diameter breast high and merchantable length.

Chunks.—Essentially sound irregularly shaped pieces with minimum volume of 5 cubic feet.

Shingle bolts.—Minimum size: 10 inches by 10 inches by 52 inches.

Unclassified material.—Minimum volume of 1 cubic foot of sound wood, included all material not fitting other use-classes, extremely difficult to handle, omitted in the office computations and not included in the final volume tables.

Field data were collected on compilation sheets designed for direct transfer of sub-totals to International Business Machine cards. The IBM punch cards were sorted by timber types, species, use classes, topography, logging method, and volume per acre for each county and district.

Manufacturing plants.—Manufacturing plants, for purposes of this study, consisted of sawmills, plywood mills, shingle mills, and lumber remanufacturing plants. A list of these was assembled from trade association directories, county assessors' records, State of Washington Department of Labor and Industries, state forest wardens, and individuals familiar with localities covered by the study.

The inventory of manufacturing residuals was based upon recent intensive studies by individuals and other agencies. These include the U. S. Forest Service (*8*), Oregon State College (*7*), Dominion Forest Products Laboratory (*3*), O. H. Schrader, Jr. (*6*), and the Red Cedar Shingle Bureau. Their studies determined types and quantities of leftovers that develop for each thousand board feet (log scale) sawed.

The data from manufacturing plants were obtained by interview with executive or research personnel at each plant visited. Information included: mill location, principal products, capacity per 8-hour shift, operating season, total volume of logs or cants used, volume or percentage of total production by species, quantity of by-products sold, fuel consumption where known or estimated, and volume and character of leftovers disposed as a nuisance.

Records of the quantities of residuals developed have been kept by some mills and where known actual figures were used. Where

unknown, data from the aforementioned reports were applied to determine total leftovers developed. The volume of by-products sold (fuelwood, pulpwood, pulp chips, handle blanks, sawdust, shavings, etc.) or used as mill fuel was converted to equivalent cubic feet of solid material and deducted from the total amounts of residuals developed. Stockpiles that normally are for sale were included as by-products sold. The remaining material was considered as being unused or disposed as a nuisance.

Volume from Intermediate Cutting. — Data on age-class acreage by type, site, and degree of stocking for each county were obtained from forest type and site maps prepared by the forest survey of the U. S. Forest Service. All information was corrected to 1950 on the basis of withdrawals through fire, insects, and decay, liquidation cuts, windthrow, breakage, and incomplete utilization.

On the basis of log hauling costs, it was determined that intermediate cutting may be practiced within a distance of 24.7 miles on surfaced highways plus 10.9 miles on unsurfaced roads. Thus, the practical hauling limit was determined. This limit, as calculated, was plotted on the type maps. Then within the limit, the total acreages for each 10-year age class by type, site, and degree of stocking were measured, and the yields were computed for 1950. Predicted yields for subsequent cuttings were shown in additional tables.

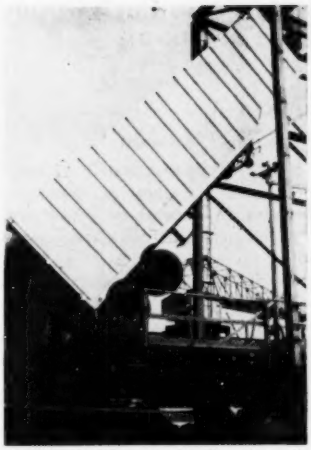

FIG. 3.—Method of unloading 10 units of pulp chips, the refuse of a nearby plywood mill with installed chipper.

Tabulation of Results

Results were tabluated for each county and economic district and were prepared in several ways to be helpful to the greatest number of users. The information contained in each table is listed below:

Table 1. Average volume per acre of logging residuals by use classification (sawlogs, poles, bolts, etc.) and timber type.

Table 2. Total volume of logging residuals by timber types classified by distance from landing (500 feet and 250 feet). Only that material lying within 500 feet of a landing was considered available.

Table 3. Total volume of logging residuals by species and use classification.

Table 4. Total volume by species of manufacturing residuals developed, sold, used as mill fuel, and disposed as a nuisance.

Table 5. Available volume from intermediate cutting by site, age, species, and county.

Table 6. Predicted annual volume of available material from intermediate cutting by year, county, and site.

Table 7. Total annual volume of raw material available from logging, manufacturing, and intermediate cutting by species for each county.

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Correction

In the article, "Statistics from Schools of Forestry for 1951: Degrees Granted and Enrollments," appearing in the April 1952 JOURNAL, the following corrections should be made: (1) on page 265, under "Graduate Enrollments" the third and fourth sentences should read: *New York again has the largest enrollment for the master's degree with 69, but is followed closely by the University of Michigan with 62. In the field of the doctorate, these two institutions change places, with the University of Michigan having 38 candidates and New York 33.* (2) The early report from the University of Michigan indicated that two Ph.D. degrees were granted in 1951. A later report from the university shows that actually four doctorate degrees were granted in 1951. This change affects Tables 1 and 2 and discussions thereof.

Differential Time of Change From Earlywood to Latewood Along the Bole of Young Loblolly Pine Trees

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SEVERAL INVESTIGATORS have made studies of the time of change from earlywood (so-called springwood or region of large cell formation) to latewood (so-called summerwood or region of small cell formation) along the bole of many tree species in past years. Their results are not uniform, possibly because of the various methods employed and possible differences among tree species and among trees of different ages in the same species. Grossenbacher (*2*) in his excellent summary of radial growth studies discusses the probable causes of earlywood and latewood formation in the annual ring, but makes no mention of the time of change from one to the other. Brown (*1*) made weekly cuttings along the bole of various trees and studied the growth changes by microscopic analysis. Lodewick (*3*) employed the technique devised by Brown and found that in northern white cedar, latewood formation occurred early in July on the upper bole and later in the same month on the lower bole. He also found that white ash and other ring porous trees exhibited a marked tendency towards completion of earlywood formation throughout the bole before latewood was formed at any point. Rees (*4*) studied red spruce, using the same techniques developed by Lodewick. The trees in his study ranged in age from 150 to 300 years and were up to 80 feet in height. On each tree he made weekly cuttings at various levels up to the point where the tree was between 3 and 5 inches in diameter. His results indicate that earlywood formation ceases about mid-July and latewood formation begins along the entire tree bole at that time.

It is the purpose of this paper to present data indicating that there is a differential time of change from earlywood to latewood along the bole of some young loblolly pine trees.

Methods

One tree, approximately 37 feet high and 6 inches in diameter breast high, located in a 14-year-old loblolly pine plantation was felled on September 9, 1946. Sections about 2 inches wide were removed from the bole at ground level, d.b.h., and at 50 percent, 65 percent, and 80 percent of the total height of the tree. These sections were selected to conform to the places of measurement in another study being simultaneously conducted by Young and Kramer (*5*). The latewood formation of the five sections, for the current year, was examined. A comparison of the measurements indicated that the greatest amount of latewood was at ground level, decreasing with increased height up the tree, and none was present in the top section. To verify this, exactly a year later, three more trees were felled in the same plantation and similar sections were removed from the bole. The five sections of all four trees were allowed to dry thoroughly and then the lower surface of the ground section and the upper surface of all other sections were smoothed on a drum sanding machine.

Six radii were selected at random on the smoothed side of each section and the length of each from the pith to the cambium was measured. The average of the six radii was considered to be the average for the section. An actual radius corresponding to the calculated average was then located on the section and a pencil line drawn along it. A scale with 0.01-inch units and a large magnifying glass were used to measure the width of the earlywood and latewood in each annual ring on the section.

Results

In both years the trees were cut approximately 4 to 6 weeks prior to the normal cessation of growth. In 1946, no latewood had formed at the 80 percent level on the one

TABLE 1.—EARLYWOOD AND LATEWOOD IN 0.01-INCH UNITS FOR 3 YEARS ON FOUR LOBLOLLY PINES AT FIVE PLACES ON THE TREE BOLE

Height above ground	Year		Year		Year	
	early	late	early	late	early	late
			Tree No. 1			
	1944		1945		1946	
Ground level	16	9	13	14	16	5
Breast height	10	6	7	8	9	4
50% total height	22	4	20	6	22	2
65% total height	21	4	25	3	21	2
80% total height	21	2	23	2	20	0
			Tree No. 2			
	1945		1946		1947	
Ground level	5	11	8	11	5	4
Breast height	8	6	9	5	5	3
50% total height	19	6	13	5	10	3
65% total height	23	6	23	4	16	3
80% total height	25	3	26	4	13	2
			Tree No. 3			
	1945		1946		1947	
Ground level	5	11	8	6	4	2
Breast height	6	7	6	5	3	2
50% total height	13	11	14	4	7	2
65% total height	21	5	17	4	12	2
80% total height	24	3	15	2	13	1
			Tree No. 4			
	1945		1946		1947	
Ground level	3	10	3	5	1	3
Breast height	4	6	5	4	2	2
50% total height	13	4	9	3	6	2
65% total height	16	4	15	4	11	2
80% total height	21	2	14	2	11	1

tree cut, but in 1947 all three trees had formed some latewood at the 80 percent level (Table 1) by the time the tree had been felled. If this study had been conducted at the end of the growing season, the net effect would have been to observe a small general increase in the amount of latewood along the entire bole.

According to the data in Table 1, more latewood is formed at base of the tree than anywhere else on the bole, and there is a progressive decrease in the width of the latewood portion of the annual ring from the base to the top of the tree. At ground level and breast height, the width of the latewood is generally equal to or greater than the width of the earlywood. For each of the 3 years, for which the data are available in Table 1, the absolute amount of latewood formation at any given position decreases with each year except near the top of the tree.

The breast high section of tree No. 4 was selected to demonstrate the amount of the annual ring, as a percentage, in summerwood over an 11-year period (Table 2). Measurements of one breast high section were considered adequate because of the similarity in rate of change from earlywood to latewood exhibited by all five breast high sections. All measurements were made in the manner previously described. In Table 2, it is apparent that latewood as a percent of the total annual ring increases with increased age of the tree at that particular height above the ground. It is interesting to observe, however, that the actual amount of latewood laid down in any year ranged only from 0.04 to 0.07 inch. In 1947, only 0.02 inch of latewood had been laid on but it must be kept in mind that the tree was felled over a month before the end of the growing season.

Discussion

In a growth study being conducted simultaneously with this one, Young and Kramer (*5*) obtained weekly measurements of diameter growth on 18 other trees in the same plantation for the 1946 and 1947 growing seasons. Measurements were made at similar heights on trees as in this study but none were made at the ground level. Since the weekly radial growth of similar trees was known it was possible to calculate the approximate date of the cessation of earlywood and the inception of latewood formation for each section. On the basis of such calculations, it seems that latewood formation started late in June at breast height, late in July at the 50 percent level, early in August at the 65 percent level, and in early September at the 80 percent level.

TABLE 2.—EARLYWOOD AND LATEWOOD IN 0.01-INCH UNITS FOR EACH ANNUAL RING AT BREAST HEIGHT ON TREE NO. 4

Year	Earlywood	Latewood	Total	Latewood as a percentage of annual ring
1937	33	4	37	11
1938	33	6	39	15
1939	29	4	33	12
1940	13	7	20	35
1941	12	4	16	25
1942	9	6	15	40
1943	5	5	10	50
1944	6	5	11	45
1945	4	6	10	60
1946	5	4	9	44
1947	2	2	4	50

In his study of old red spruce trees, Rees was unable to make cuttings in the tip section (from 3 to 6 inches in diameter to the terminal bud). If he had been able to extend his cuttings to within the comparatively young portion of the tree, he might have found a less uniform time of change from earlywood to latewood. In the summer of 1948, a number of loblolly pine trees ranging in age from 60-80 years, that were felled in a logging operation, were examined. On the lower two-thirds of the bole, the annual growth had been uniform for many years and the proportion of earlywood to latewood appeared to be similar to the red spruce described by Rees, but sections cut on the upper bole had annual rings similar to the four young trees felled for this study.

Summary and Conclusions

Four 14- and 15-year-old loblolly pine trees were felled and sections removed at ground level, breast height, 50 percent, 65 percent, and 80 percent of total tree height. Measurements were made of the earlywood and latewood of each annual ring on the average radius on the smoothed surface of each section. For the current year, the percent of latewood in the annual ring decreases from the ground level to the tip and it appears that the inception of latewood at the ground level occurs in June and gradually appears up the bole until it occurs near the tip in early September. At any given place on the bole, latewood as a percentage of the annual ring increases from the pith towards the cambium.

Physiological inquiries as to the causes of earlywood and latewood formation in the annual ring have given rise to many hypotheses, none of which has been substantiated. It is believed that the concept of a differential time of change from earlywood to latewood along the bole of some young loblolly pine trees may well serve as a useful clue in this major physiological study.

Since it has now been shown that the terms, springwood and summerwood or earlywood and latewood have little meaning, their use should be abandoned as they are very misleading. The terms, region of large cell formation and region of small cell formation, are recommended as more appropriate and descriptive of these two easily identifiable portions of the annual ring.

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The Moisture Content of Green Hickory

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HICKORY, A COMMON SPECIES throughout eastern forests, is often considered a detriment to the forest because the wood is very hard, difficult to saw or machine, heavy to handle, often difficult to season uniformly, and sometimes quite defective (Fig. 1). Because of these characteristics, much hickory is left in the wood by timber operators; in some areas it is a problem where it dominates the remaining stands. In spite of this unpopularity, hickory has many characteristics that make it a unique wood. It is outstandingly resistant to shock, has good bending qualities, takes a beautiful finish similar to walnut, and is available in quantity at a low price.

A recent cooperative study has been made to learn more about the moisture content of hickory[1] and to find how this might affect the economics and technicalities of using this wood. The outstanding result of the study is to show that the heartwood of green hickory has a much higher moisture content than the sapwood. In a majority of species, the sapwood contains the most water. In only a few species such as oak, elm, and beech, does the moisture content of heartwood equal or exceed that of the sapwood.

The moisture content of most living trees varies with species, varies between heartwood and sapwood, varies in different parts of the tree, and even by seasons of year. These variations in turn have an effect on the necessary seasoning processes, and on all forms of utilization as lumber or other wood products. It is hoped that knowledge of the rather high degree of difference between moisture content of inner and outer wood in green hickory will be a clue to greater use for this abundant, often unwanted, but potentially valuable species. The wetter heartwood dries much slower than the sapwood. Differential stress, already existing, is accentuated in the seasoning process. Consequently, the little-known peculiarities of hickory moisture content will have to be taken into account if hickory is to be widely used.

FIG. 1.—Longitudinal splitting of hickory during or shortly after felling is one of the reasons why loggers leave hickory in the woods.

Method of Study

Two separate studies of the moisture content of hickory were made in the northwestern part of South Carolina. The first study, made in August 1949 in the mountains northwest of Pickens, S. C., at an elevation of 2,000 feet, involved 111 measurements of the moisture content of 35 mature, old-growth hickory trees. The second study comprised 81 measurements of moisture content from second-growth hickory trees in the Upper Piedmont region near Clemson, S. C. Here measurements were taken from three trees each month from April 1949 to March 1950. In each study, measurements were made of both heartwood and sapwood at the base of the tree and at points 24 feet or more above the stump. Immediately after the trees were felled, samples were obtained, sealed to prevent moisture loss, and weighed within a few hours. They were then oven-dried at approximately 200 degrees F. until they maintained constant weight. Their original moisture content was determined by the following formula:

$$\text{Moisture content } (\%) = \frac{\text{Green weight} - \text{oven-dry weight}}{\text{Oven-dry weight}} \times 100$$

Results of Study

In the Clemson study, the moisture content of green hickory sapwood averaged 51.7 percent and of the heartwood, 70.0 percent; in the Pickens study, the average moisture contents were 49.4 and 74.1 percent, respectively. With so little difference between areas, the data could be combined for the analysis of other variables.

The results of all 192 measurements showed that the average moisture content of green hickory sapwood was 51.0 percent and that of the heartwood was 70.5 percent. As shown in Table 1, there was no appreciable difference in the moisture content of the several species measured.[2]

The average of all data showed a slightly lower moisture content for the sapwood in the upper portion of the trees, but an insignificant difference in the heartwood moisture content between the butt and upper portion of the trees (Table 2).

The Clemson data showed that there is no significant monthly trend in the moisture content of

[1]This study was conducted by the Southeastern Forest Experiment Station, the South Carolina Agricultural Experiment Station, and the Poinsett Lumber and Manufacturing Company. It is listed as Technical Contribution No. 192 at the South Carolina Agricultural Experiment Station, Clemson, S. C.

[2]Recent unpublished data procured by the Forest Products Laboratory show that water hickory (*Carya aquatica*) from Mississippi had a sapwood moisture content of 69.9 percent and a heartwood moisture content of 91.8 percent; and shagbark (*Carya ovata*) from Kentucky had a sapwood moisture content of 50.0 percent and heartwood moisture content of 69.1 percent.

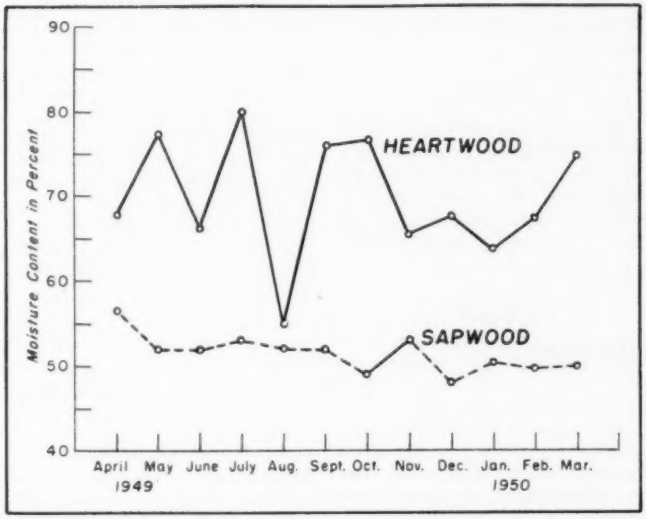

FIG. 2.—Green hickory moisture content by months. Data from Clemson study.

TABLE 1.—MOISTURE CONTENT OF GREEN HICKORY SAPWOOD AND HEARTWOOD BY SPECIES

Species	Moisture content			
	Sapwood		Heartwood	
	Observations	Moisture content	Observations	Moisture content
	Number	*Percent*	*Number*	*Percent*
Mockernut (*Carya tomentosa*)	46	51.9	30	69.7
Pignut (*Carya glabra*)	45	49.2	27	71.2
Sand hickory (*Carya pallida*)	4	49.9	2	67.5
Red hickory (*Carya ovalis*)	20	52.4	11	69.2
Bitternut (*Carya cordiformis*)[1]	4	53.9	3	79.8
Totals and averages	119	51.0	73	70.5

[1]Although *Carya cordiformis* is not a true hickory, its wood is not distinguished from the true hickories in commerce.

TABLE 2.—MOISTURE CONTENT OF GREEN HICKORY AT THE BASE AND IN THE UPPER PORTION OF TREE STEMS

Position in tree	Sapwood		Heartwood	
	Observations	Moisture content	Observations	Moisture content
	Number	*Percent*	*Number*	*Percent*
Butt	66	52.9	48	71.0
Upper portion	53	48.5	25	69.6
Totals and averages	119	51.0	73	70.5

TABLE 3.—EFFECT OF LEAF SEASONING AND TIME SEASONING ON THE GREEN MOISTURE CONTENT OF HICKORY

Treatment	At time of cutting				6 weeks after cutting			
	Sapwood		Heartwood		Sapwood		Heartwood	
	Observations	Moisture content	Observations	Moisture content	Observations	Moisture content	Observations	Moisture content
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Controls	23	48.0	17	71.0	0		0	
Leaf seasoning	11	52.1	8	71.0	10	48.6	8	76.1
Time seasoning	13	51.2	7	71.9	7	47.7	7	85.1

green hickory sapwood or heartwood throughout the year (Fig. 2).

In the Pickens study some trees were felled and left on the ground with all limbs attached for 6 weeks before trimming and bucking (leaf seasoning), while other trees were felled and trimmed but not bucked into logs for 6 weeks (time seasoning). Neither of these treatments caused any appreciable difference in moisture content (Table 3).

Discussion of Results

Not enough measurements were obtained for each variable of species, season, position in tree, location, etc., to permit a statistical analysis of the results obtained. However, the pattern made by the measurements obtained indicates that hickory has a moisture-content relationship between heartwood and sapwood even more severe than such refractory species as oak, beech, elm, and a few others. An average heartwood moisture content of 70 percent versus a sapwood moisture content of 50 percent can spell failure in the seasoning process if this relationship is not understood. The porous sapwood dries readily and rapidly in the air-seasoning yard or in the kiln, whereas the almost impenetrable heartwood will give up its moisture slowly even under severe drying conditions. Ignorance of this condition can mean serious drying defects and a "finished" product that checks, warps, cups, and shows other signs of severe internal stress.

Theories of cutting hickory at certain seasons of the year to reduce logging weights or to simplify seasoning procedures are not borne out by this study. Neither would the practice of leaf seasoning or time seasoning appear to lower moisture content or reduce weight, although other studies[2] have shown leaf seasoning to be effective in reducing weights in other species.

The results of this study indicate that the operator drying hickory

[2]McIntosh, D. C. Treatment of trees with chemicals (Stevens, Ontario). Transpiration experiment; observations of trees felled and left with foliage intact. Canada Forest Serv. Mimeo. 0-141. July 1949.

should separate the heartwood boards from the sapwood boards, not because of quality, since hickory heartwood has been shown to be as tough as hickory sapwood,[4] but merely from the standpoint of economies in seasoning. Furthermore, in kiln drying hickory that contains heartwood, the kiln samples should be heartwood, with the schedules based on the drying rate of heartwood rather than that of sapwood.

[4]Forest Products Laboratory Technical Note No. 171. Red hickory as strong as white hickory. Rev. July 1936.

Summary

Hickory is a wood superior to any other material for certain uses. It is much sought when it is dense and sound. But much hickory is not dense enough for specialty uses such as ski stock, striking handles, etc., although it is still a tough, usable wood that finishes well and should find numerous outlets in commerce. There is much mystery surrounding this wood and its possible uses. Its extreme hardness and variability in density result in its being left in the woods by many timber operators. Knowledge that moisture content of green hickory heartwood averages 25 percent greater than that of sapwood provides a beginning in pointing to the potentialities of this wood.

Management Planning on the National Forests[1]

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The national forests, in 40 states, Alaska, and Puerto Rico include some 81 million acres of commercial forest land (5 million of which is in Alaska). About 700 working circles are recognized, averaging somewhat more than 100 thousand acres apiece.

The present underdeveloped condition of many working circles limits the annual cut to about 4 billion board feet. When some 5,000 miles of additional access roads are built the allowable annual cut will rise to 6 billion feet; eventually these public properties will be developed to the point where they can yield 10 billion board feet of sawlogs and other forest products annually.

THE WORKING CIRCLE is the primary unit of management. Forest Service policy is to attain and maintain sustained yield, working circle by working circle. Most national forest working circles include varying amounts of forest land in private, state, or other federal ownership, but regulation of cut applies only to the national forest lands unless other lands are formally committed to unified management, as in a cooperative sustained yield unit.

National forest working circles vary greatly in size. Some are as small as 40,000 acres, the largest over a million acres. In many cases the boundaries are not necessarily permanent. Transportation routes and methods change to the extent that topographic boundaries become less important, even in rugged country. Working circle and ranger district boundaries generally coincide in the eastern regions. There is a definite trend toward this in the West also. Another development, which really amounts to a variation in terminology, is to consider an entire national forest as a working circle, but to regulate the cut by blocks or by ranger districts. A management plan now being drafted for the Harney National Forest in South Dakota, designates the entire forest of some half-million acres as one working circle. Each of the six ranger districts is called a block with an individual cutting budget. Another example is the Francis Marion National Forest of 245,000 acres in South Carolina, which is covered by one management plan. Each of the two ranger districts is designated a working section, and each has its own allowable cut and cutting budget.

[1]Paper presented at a meeting of the Division of Forest Management, Society of American Foresters, Biloxi, Miss., December 14, 1951.

Objectives in Management Plans

A management plan is a flexible guide to the sustained production, harvesting, and disposition of the raw timber products of a working circle. National forest management plans are long-range guides, with detailed prescriptions for shorter periods. Changing conditions necessitate revision about every 10 years. The plan always should reflect current information and practices.

The Act of June 4, 1897 (30 Stat. 35) directs the Secretary of Agriculture to manage the national forests so as to "... furnish a continuous supply of timber for the use and necessities of the citizens of the United States."

This clearcut directive for sustained yield is further amplified in Secretary's Regulation S-1:

> The Chief, Forest Service, is hereby authorized to permit the use of the timber resource of the national forests and to delegate this authority to subordinate officers, to the extent, in ways, and by means compatible with the laws and the other regulations of the Secretary of Agriculture concerning such use, so as to make that resource of the greatest permanent usefulness to the people of the United States.

Forest Service policy is to produce the largest practicable yields of useful material from the national forests. This means, for example, that the objective on southern pine working circles is to grow quality sawtimber as the chief crop but to use thinnings and topwood for pulpwood, posts, etc. In the West, ponderosa pine, Douglas-fir and associated species are managed on rotations designed to produce good yields of sawtimber. Some species, which are not particularly valuable for sawtimber,

such as sand pine in the South, aspen in the Lake States, lodgepole pine in the West, hemlock in Alaska, may be managed primarily for the production of pulpwood.

When "sustained yield" is mentioned in this paper, it is important to note that a relatively high level of sustained yield is meant. This involves maintaining a growing stock which will sustain the yield at about the productive capacity of the soil of the working circle.

Each national forest management plan considers and coordinates timber production with the development, maintenance, and use of other inherent values of the working circle, such as recreation, range, wildlife, and water. Coordination is attained on the ground in administration of the plan by the ranger.

A continuing objective of the management of national forest timber is the stabilization and support of communities which depend in whole or in part on timber. The support may be diffused, as in most southern working circles, or it may be concentrated largely to one community, such as Flagstaff, Ariz. or Lakeview, Ore. Community support is a sound social objective which raises many legal, political, and policy issues. Usually there are no simple solutions, but the Forest Service believes that slow but steady progress is being made.

Essentials of a Management Plan

Regulation S-3 of the Secretary of Agriculture provides the framework for national forest management plans:

> Management plans for national forest timber resources shall be prepared and revised, as needed, for working circles or other practicable units of national forest. Such plans shall:
>
> 1. Be designed to aid in providing a continuous supply of national forest timber for the use and necessities of the citizens of the United States.
> 2. Provide, so far as feasible, for the stabilization of communities and of opportunities for employment.
> 3. Be based on the principle of sustained yield, with due consideration to the condition of the area and the timber stands covered by the plan.
> 4. Be approved by the Chief, Forest Service, unless authority for such approval shall be delegated to subordinates by the Chief.
> 5. Establish the maximum amount of timber which may be cut from the national forest lands within the Unit by years or other periods.

No fixed outline is prescribed. On the contrary, the regions are given the responsibility of developing the form and contents of management plans which will serve best as working tools. It is not the objective to spend time and money preparing management plans as an intellectual exercise. The policy is that the ranger who will administer the plan shall write it, or at least participate in the job. The chief has delegated to regional foresters the responsibility of approving temporary "streamlined" management plans, but otherwise each plan is reviewed in the regional office and in the Washington office and is approved by the chief. Thus, wide latitude is afforded in plan preparation, but provision is made for coordination of policies and procedures expressed in all management plans.

In addition to description of the physical aspects, timber resources, the local economic and social situation, and the coordination of timber management with other uses of the national forests, it is essential that the management plan cover: (1) silvicultural considerations, (2) transportation system, and (3) regulation of cut.

Silviculture.—The basic silvicultural system for each forest type on the working circle is prescribed in the management plan. When uneven-aged silviculture is used, all cutting is by tree selection, whereas under even-aged silviculture intermediate cuts are selective, but harvest cuts are clearcuts. When clearcutting is prescribed careful attention is given to the size and location of the cutting areas, which are kept as small as practicable.

Uneven-aged silviculture, meaning that harvest cuts are made entirely by individual tree selection, is applicable to only a few types which occur on the national forests, such as northern hardwoods, where sugar maple predominates, and oak-hickory.

Group selection is essentially even-aged silviculture applied to very small areas. National forest experience with group selection is limited, except that individual tree selection cutting often tends to produce a group-wise pattern through removal of two or more trees in close proximity. Group selection may be applicable to such important types as ponderosa pine and southern pines.

The Unit Area Control[2] concept, now on trial in California, may be considered as a refinement of group selection. It emphasizes treatment of each small unit of area so as to retain control of the ground and maintain production at a high level. Its application to ponderosa pine is being studied. It may prove useful in a number of other types, although not necessarily exactly as originally developed for application to the mixed conifer stands of the western slope of the Sierra.

Harvest cuts have a dual purpose, to harvest the existing stand and to regenerate the cut-over area. Regeneration provisions vary widely in national forest management plans. The shelterwood method works well with some types, such as ponderosa pine in the Black Hills. Selected seed trees may be relied upon in some southern pine working circles, provided low-value hardwoods are controlled. Seeding from cones in the slash is satisfactory in lodgepole pine. Seed from adjacent uncut timber usually will reseed small clearcut patches in old-growth Douglas-fir. Patches may vary from 10 to 60 acres in size, and the first cut covers about a third of the merchantable area. Planting is necessary with some Douglas-fir and western white pine harvest cuts and may be needed for red pine. In lodgepole pine, clearcut patches or contour strips vary from 5 to 50 acres and usually cover about half the merchantable area. The width of clearcut strips must be controlled within rather narrow limits with species like Engelmann spruce, where seeding from the side is needed to supplement advance reproduction.

Transportation. — The development and maintenance of an adequate system of primary, second-

[2] Hallin, William E. Unit area control in California forests. California Forest and Range Exp. Sta. 1951.

ary, and spur roads is an important part of the management of a working circle. Much study has been given to the location and types of roads which will best serve the purpose. In the absence of adequate funds to accomplish the entire job, priorities must be established. Usually the main roads which serve an entire working circle should be built with public funds. Timber sale purchasers usually are required to build secondary and spur roads.

Where cutting cycles of 10 years or less are used, as in the South, continuous maintenance is needed. In parts of the West, where intervals between cuts are much longer, the spur roads and some secondaries are "put to bed" and not maintained between cuts.

velopment of techniques and practices of location, construction, and maintenance of timber access roads. Many of the primary routes must serve other purposes as well as log and lumber hauling. Alignment, grade, width, base, surfacing, and other technical details are not covered in timber management plans, but such plans should contain a statement of the transportation problems and a schedule of needs during the plan period.

Regulation of cut.—The subject of regulation of cut is of paramount importance in each national forest management plan. The determination of rotation, length of cutting cycle, or interval between intermediate cuts, and the amount and character of growing stock to be carried are necessary parts of regulation.

Rotation (in years) is necessary to even-aged management, which, as previously developed, will be employed on most national forest working circles. The usual practice is to select a rotation which coincides with the culmination of mean annual increment (as determined from published yield tables) or extends a few decades beyond that point.

For example, the Francis Marion Management Plan (South Carolina) includes this discussion of rotation in the pine working group:

> Normal yield tables indicate a rotation of eighty years based on culmination of annual growth for the entire pine group. This rotation is adopted and divided into four periods of twenty years each.
>
> The 1936 Management Plan indicated a rotation of 100 years. It is felt that this is too long for loblolly pine. Ordinarily, loblolly stands start to break up before 100 years and not much volume is gained between 80 and 100 years. A 100-year rotation might be more desirable for longleaf pine but inasmuch as this forest is predominantly loblolly, 80 years are considered adequate.

The Hood River Working Circle Management Plan (Oregon) develops a rotation of 130 years for Douglas-fir and associated species shown as follows:

> The unit should be cut over as rapidly as possible in order to capture mortality, develop a utilization road system, make it possible to do stand improvement work or insect control work if necessary, remove overmature and poor quality trees, increase opportunities for utilization of small stems from thinnings and begin to put the stands in growing condition. Fort Valley research findings indicate net growth, after a harvest cut, begins to decline after 15 years and drops relatively rapidly after 20 years. The cutting cycle is, therefore, established for the first harvest cut at 20 years. Cutting to date of over 27 million board feet is roughly equivalent to one year's cut so the first cutting cycle has 19 years to go in the ponderosa pine type.

The management plan for the Sabine Working Circle (Texas)

> A rotation for the working circle was selected on a weighted average basis in the following manner:

Site class	Site index	Acres regulated commercial	Percent of total acres	Percent x Site index	
II-III	155	2,223	2.75	4.26	Weighted average
III	140	17,984	22.28	31.19	S.I. = 119.58,
III-IV	125	15,638	19.37	24.21	rounded to 120.
IV	110	37,334	46.24	50.86	
IV-V	100	5,108	6.33	6.33	
V	90	2,448	3.03	2.73	
Weighted average			100	119.58	

> Although much of the Douglas-fir grows on sites of a higher index, where a shorter rotation might be used, the figure of 130 is accepted since such a rotation will allow for some quality increment of timber on the better sites. Stands supporting inferior species on poorer sites should perhaps be managed on a shorter rotation for pulp on a cubic foot basis. Since it is impossible to predict what will or will not be used for pulp or saw species a hundred years hence, these stands will be managed on a saw log rotation until such time as economic conditions dictate a change from this procedure. Inclusion of the volume of such stands is done with the full realization that their contribution to the allowable cut in the immediate future will be taken largely from the more desirable saw-timber types. This procedure is based on the assumption that by the time the better stands are depleted, the market in this vicinity will be ready and willing to accept sales of less desirable species. As previously indicated, an effort will be made to make sales of the so-called inferior species whenever the market will permit.

The cutting cycle (the number of years between repeated cuts on the same area) applies continuously to uneven-aged management, but also is employed widely in even-aged management for scheduling the cuts to be made during a period when the growing stock on a working circle is being adjusted (upward or downward) to the volume which is to be carried.

There has been a very definite, and continuing, trend toward shorter cutting cycles. Thirty years is about the longest now in use. 20-year cutting cycles are becoming common. 10-year and 8-year cycles are used in some working circles.

The North Kaibab Working Circle Management Plan (Arizona) prescribes a 20-year cutting cycle for ponderosa pine:

justifies a prescribed 10-year cutting cycle for southern pines as shown on page 621.

Development of the allowable annual cut involves determination of rotation, cutting cycle, inventory, growth rates, amount and condition of growing stock, objectives of management, and utilization practices. The Forest Service prescribes no standard method for making this calculation. The allowable cut usually is developed for the entire rotation, but sometimes is determined in detail only for one or more segments of the rotation, such as cutting cycles. It is always subject to revision. New inventories, major losses (fire, insects, diseases, etc.), changes of utilization, and other factors may cause recalculation of the allowable cut

PROOF OF VALIDITY OF 10-YEAR CUTTING CYCLE
Residual Volume, MBM, on Past Sales Extended for 10 Years

Compt. No.	Vol. per acre Original	Residual	Growth factor[1] (Appropriate regression)	Vol per acre in 10 years
14	3,632	2,397	$y = 705 + .169x$	4,805
34	2,736	1,713	$y = 872 + .187x$	4,320
58 E½	4,135	2,787	$y = 705 + .169x$	5,338
58 W½	3,076	2,062	$y = 705 + .169x$	4,346
3	2,880	1,933	$y = 872 + .187x$	4,630
13 S½	4,030	2,700	$y = 872 + .187x$	5,711
13 N½	3,735	2,388	$y = 705 + .169x$	4,929
4 S½	4,654	3,360	$y = 705 + .169x$	6,119
54	2,615	1,752	$y = 872 + .187x$	4,376
35	3,106	2,072	$y = 872 + .187x$	4,826
14 (Pt.)	2,366	1,663	$y = 705 + .169x$	3,801
57	3,694	2,161	$y = 872 + .187x$	4,952
19	3,012	1,916	$y = 705 + .169x$	4,146

In all cases the 10-year growth of the residual stand will exceed the volume of the cut. The 10-year cycle will not only permit restoration of cut volume, but will allow an appreciable increase in volume.

[1]Based on type of largest operable acreage in each sale.

at any time.

The allowable cut is expressed in terms of volume, usually board feet, sometimes cords or other units. Control may be by volume or by area. Regulation by volume control is traditional in the old-growth forests of the West. In recent years, however, there has been a considerable development of regulation by operable area control in second-growth forests of the South and the Lake States. Both methods have value, and each should be tempered by the other. For example, if volume only is considered, faulty inventories may cause too rapid or too slow cutting. Undesirable results also are almost sure to follow if control is attempted purely on an area basis. Most working circles contain widely varying stands, and merely cutting equal areas annually is sure to cause fluctuations in the administrative work load as well as in the volumes available annually to dependent industries. Thus, where regulation is by volume control the areas to be cut annually also should be calculated, and if area control is used, volumes should be determined. Usually this results in some adjustments to develop an approximately equal annual flow of raw material from the working circle.

Various formulae are used in calculating the allowable annual cut. The Hanzlik[3] method is a useful tool for regulating the cut in an undeveloped working circle during the first rotation. If a high percentage of the stands at the start of the period are old-growth, application of this method will develop a near-normal distribution of age classes by the start of the second rotation.

A rather general situation on western working circles is excess growing stock of mature and overmature timber. Some management plans regulate the cut under this circumstance by selecting an adjustment period (which may vary from one cutting cycle to the entire first rotation) and applying a morification of Heyer's formula.[4] This involves a decision as to the amount of growing stock which should be carried to produce adequate yields of high quality timber. Usually these quantities are referred to as "desired growing stock."

Some use has been made of the Lake States formula[5] in calculating the allowable cut in Lake States management plans. This formula is designed to distribute the cutting of merchantable age classes over long enough periods to improve areal distribution and approach normality. It employs flexible rotations.

Great importance is attached to the cutting budget. It translates the allowable cut into a list of the specific areas to be cut during a 3- to 5-year period. A continuing

IRON RIVER WORKING CIRCLE, OTTAWA NATIONAL FOREST CUTTING BUDGET

August 1, 1949 to July 30, 1952
(In approximate order of entry for sales)

Block No.	T-R	Hardwood & hemlock	Aspen-p. birch	Spruce-fir	Spruce-tamarack	Red & wh. pine	Total acres	Total Cords	net-volume MBF	Estimated cut Cords	MBF
1	42-36	77					77		272		68
2	42-37	90		27	5		122	238	259	93	64
7	44-36	10	150	40			200	1,607	26	1,407	6
8	44-36	102	112	98	2		314	1,901	362	1,300	90
9	44-37	757	7		7		771	150	2,817	91	739
10	44-37	125		7			132	39	441	14	110
11	44-37		20				20	126		126	
12	45-36		84	10		50	144	1,285	724	1,209	191
15	45-35	7	72				79	528	74	528	30
23	45-37		23	38			61	344		350	
24	46-35	167		15	5		187	231	1,631	95	642
29	46-37	484				357	841	492	5,452	148	1,335
5	43-37	10	108	33	38		189	1,348	26	977	6
13	45-35	101	382	39	27		559	4,678	457	4,211	134
18	45-36	15	230	52	65		362	2,738	100	2,054	35
19	45-36		34				34	268		268	
17	45-36	12		38		18	68	516	162	227	37
25	46-35	236	94	428	93		851	7,393	1,203	3,702	389
27	46-36	35		7		5	47	64	339		25
28	46-36	40					40		102		25
3	43-36	129		47	25		201	735	749	295	250
14	45-35	198	447	17	2		664	4,693	1,621	4,582	613
16	45-36	20	22	27			69	412	131	259	48
21	45-37					25	25	334		124	
26	46-36	72	35				107	458	758	458	303
30	46-36	42			27	42	111	390	488	136	123
6	44-36		30	18		318	366	4,821		1,769	
20	45-37	5	30	63			98	629	33	394	12
4	43-37	86					86		498		169
22	45-37	304	25		10	53	392	1,007	1,059	455	264
Totals		3,124	1,915	1,004	306	868	7,217	37,625	19,784	25,300	5,804

[1]Jack pine.

[3]Hanzlik, E. J. 1922. Determination of the annual cut on a sustained yield basis for virgin American forests. Jour. Forestry 20:611-626.

[4]Chapman, H. H. 1951. Forest management. 436.

[5]Guilkey, P. C. and S. R. Gevorkiantz. 1949. Allowable cut, Lake States Forest Exp. Sta.

cutting budget, covering a 3-year period, is a recent development. It is reviewed and extended annually. The areas and volumes cut during the past year are posted to the control record, the planned cutting for the next two years is reviewed and revised if necessary, and the budget is extended for another year. Thus at all times the ranger has a definite 3-year cutting plan within which he still has leeway to make changes in the order of cutting as conditions change.

When regulation of cut is attained by operable area allotment the cutting budget lists the areas to be cut by compartments or other units. Maps prepared from aerial photographs are valuable aids in budgeting. The copy of a continuing 3-year cutting budget for the Iron River Working Circle (Michigan), illustrates the operable area budgeting technique.

Use of Management Plans

The management planning job of the Forest Service will never be completed. Much progress is being made in plan preparation and in modernizing plans which have become obsolete, but considerable work remains to be done. All plans will need periodic revisions. It is encouraging to report that management plans are steadily becoming increasingly useful working tools. They aid in developing work plans, in scheduling cruising and appraisal work, in assigning personnel, and in conducting the timber merchandising business. An advantage is gained in continuity of policies and programs. An adequate management plan, properly administered, combined with a simple record of actions taken under the plan, is essential to intelligent management of any forest property —large or small.

Determination of Color of Nursery Stock Foliage By Means of Munsell Color Charts[1]

S. A. Wilde and G. K. Voigt
Respectively, professor of soils, and instructor in soils, University of Wisconsin, Madison.

DETERMINATION of the nature of deficiency diseases and other causes of nursery stock deterioration, as a rule, presents considerable difficulties. The success of such a diagnosis depends in a large measure upon careful examination of all possible clues provided by external as well as internal properties of the deteriorated seedlings. In this connection, the color of leaf or needle tissue frequently furnishes valuable information on the critical deficiencies of certain nutrient elements or the presence of toxic substances (*2,3,4*).

Adverse Soil Conditions Revealed by Leaf Color

An outline of the most common adverse soil conditions, as revealed by the color of leaf tissue, follows.

Deficiency of nitrogen. — Coniferous seedlings show pale green color; at the advanced stages, tips of the needles may become pink and then deep red; spots of dead tissue or necrosis may develop on lower needles. Hardwoods attain pale green or yellowish-green color which at later stages may change into red or purple; seedlings shed leaves early.

Deficiency of phosphorous. — In coniferous stock, the lower needles usually develop a pink or reddish color, and sometimes necrosis. Deciduous seedlings may develop purplish tints on the twigs and the petioles of the leaves. The leaves show purple pigmentation and bronzing. The leaves of certain species are shed prematurely.

Deficiency of potassium. — The foliage of conifers is usually bluish-green with tan to copper coloration at the tips of the needles. In some species the necrosis is most common in needles surrounding the terminal meristem and in others the needles are necrotic at the base of the plants. The leaves of deciduous seedlings lose their green color from the margins toward the veins and they later become irregularly colored, scorched, or necrotic.

Deficiency of magnesium.—The needles of seedlings show yellowish-green color and later necrosis. The chlorosis first affects the tips of the needles, and at the later stages the entire tissue. The leaves of deciduous seedlings develop light green or grayish-green blotches between veins which later turn brown, or the leaves may become chlorotic at the margins followed by reddening and necrosis. The chlorotic condition due to the lack of magnesium is developed first in older leaves, whereas similar symptoms due to a deficiency of iron appear first on the young leaves.

Deficiency of calcium. — The needles of coniferous seedlings may be stunted near the terminal bud and show a pale yellow-green to grayish-green color; the tips may become brown. In deciduous seedlings, the younger leaves are yellowish, whereas older leaves remain relatively dark green. The leaves may show irregularly shaped patches extending inward from the margin.

Deficiency of sulphur. — The leaves of both coniferous and deciduous stock become pale green and later turn yellow. The symptoms are first evident on the younger leaves.

Deficiency of boron. — The most characteristic effect appears to be a breakdown of the meristematic tissue and deterioration of buds. In some cases the leaves become chlorotic and develop necrosis. Misshapen leaves are common.

Deficiency of iron.—The terminal

[1]Contribution from the Soils Department, University of Wisconsin, in cooperation with the Wisconsin Conservation Department. Publication is approved by the director of the Wisconsin Agricultural Experiment Station.

leaves show chlorosis, which in deciduous stock is confined to inter-vein regions. In severe cases the entire leaf becomes completely yellow to orange, occasionally white.

Deficiency of manganese. — The leaves become chlorotic between the veins and show a dull yellowish-green color. In contrast to iron deficiency symptoms, which are usually confined to terminal leaves, the foliage of the entire seedling may become chlorotic.

Deficiency of copper.—The leaves show a pale green to light yellow color in the inter-vein regions; in severe cases the terminal leaves develop necrotic spots.

Deficiency of zinc. — The leaves show a yellow mottling between veins while the veins themselves and the regions along the margins may remain green.

Excess of soluble salts or presence of toxic compounds.—Needles and leaves develop a yellowish-green or gray-green color which eventually changes to red. The rate of color change and the development of intense red shades are related to the degree of toxicity and the concentration of chemical compounds.

Use of Color Charts

The summary of symptoms above may appear to be rather involved, but, fortunately, in actual practice the situation is usually greatly simplified by the maintenance of soil fertility. In the great majority of nursery soils, nutrient deficiencies are limited to nitrogen, phosphorus, and potassium, with nitrogen being of far greater importance than the other elements. In many instances the nurseryman deals with the general level of fertility or toxicity of soil rather than the lack of single elements. As experience has shown, in all these cases, precise determination of color is very helpful. This task can best be accomplished by the use of Munsell Standard Color Charts.

Munsell charts are devised to incorporate the three basic features responsible for the phenomenon of color—*hue* (color tint), *value* (brilliance), and *chroma* (saturation or purity). *Hue* refers to the dominant spectral color or equivalent, the quality that distinguishes red from yellow-red (orange), yellow-red from yellow, yellow from green, etc. It is related to the wavelength of the dominant component of the light. *Value* refers to apparent lightness as compared to absolute white, and is a function of the intensity of light. *Chroma* refers to the purity of hue, the saturation, or the apparent degree of departure from neutral grays or white. Neutral (achromatic) colors are those resulting from varying intensities of white light; they have no hue and zero chroma and include the pure grays, black and white (*1*).

In the Munsell notation, the entire range of *hue* is divided into ten equal parts, designated by the letters R (red), YR (yellow-red), etc. *Value* is designated by numbers from 0 for absolute black to 10 for absolute white. *Chroma* is designated by numbers beginning with 0 for absolute grays and increasing at equal intervals to a maximum.

The practical use of the Munsell Color Charts in application to nursery management may be illustrated by the following examples. A generally low level of fertility, particularly associated with a deficiency of nitrogen, is indicated by the color of leaf tissue ranging from 2.5GY:8/4 to 2.5GY:8/10. Stock produced on a well-balanced diet with a moderate amount of nitrogen, and hence, well adapted to planting on adverse sites, is characterized by a slightly yellow or grayish-green color, ranging from 7.5GY:6/4-6/10 to 2.5G:7/4-7/8. Deep greenish-blue color, e.g., 2.5B:3/6, often points out an undesirably high content of nitrogen. Red-purple color, 5.0RP:4/2-4/8; 3/6-3/10, revealed by part of the needle or leaf is usually a sign of an acute deficiency of phosphorus, whereas development of a brownish-yellow color, 5.0Y:8/6-8 to 7/6-10, is indicative of a potassium deficiency. A pronounced yellow color, 5.0Y:8/10, is the result of magnesium deficiency. An excess of soluble salts or toxic compounds produces a yellowish-green or gray-green color which is eventually changed to red, 5.0R:7/4 to 3/10.

At the present state of knowledge, the entire range of color in tree seedlings is covered by fifteen Munsell Standard Color Charts, numbered 2.5R, 5.0R, 10.0R, 5.0YR, 7.5YR, 5.0Y, 2.5GY, 7.5GY, 2.5G, 5.0G, 7.5G, 5.0BG, 2.5B, 2.5PB, and 5.0RP. However, future work may show the need for additional charts.

The Munsell charts are assembled in a 4½ by 7-inch looseleaf binder which is convenient for field use. These charts can be ordered at the cost of $18.50, from the Munsell Color Company, Inc., 10 East Franklin Street, Baltimore 2, Maryland.

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2. HAMBIDGE, G. 1941. Hunger signs in crops. Amer. Soc. Agron. and Nat. Fert. Assoc., Washington, D. C.
3. KITCHEN, HERMINE B. 1948. Diagnostic techniques for soils and crops. Amer. Potash Inst., Washington, D. C.
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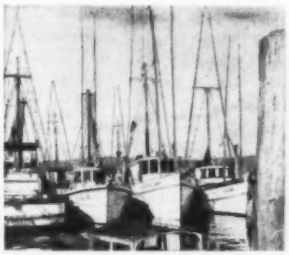
CITIES WITH A FUTUR

Big trees grow right down to the Pacific in this wonderful rain-forest land. The rugged coastline offers many sandy beaches.



Coos Bay is home harbor for giant ocean freighters as well as fishing fleets.

The Weyerhaeuser 205,000-acre Millicoma tree farm provides continuous log supply.

The new Weyerhaeuser Timber Company Coos Bay branch began production in 1951. Logs are pre-barked; the slabs and edgings are chipped and shipped to the Company's Springfield, Oregon branch for pulping. Lack of adequate fresh water supply prevents integration of pulping facilities on this particular site. Visitors are welcomed; guided tours.

NO. 9 OF A SERIES

NORTH BEND–COOS BAY

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CAPTAIN A. M. SIMPSON landed here in the early 1850's with a portable sawmill. Employment in that industry has increased steadily, and now accounts for more than 1,000 steady jobs. There is every indication that this employment in the forest industry is stable and perhaps will increase, because most of the timberland of the area is in certified tree farms, and the Coos Bay-North Bend twin cities rate as one of America's finest tidewater mill locations.

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Notes

Cold-Soaking of Jack Pine Seeds

Seed of jack pine (*Pinus banksiana*) exhibits mild dormancy for which treatment normally is not required.[1] Where prompt and even germination is especially desired, however, cold stratification for 30 days at 41 degrees F. will help. Recently some tests were made to learn the effect of cold-soaking on germination of jack pine seeds.

Previously cold-soaking had been found effective in improving seed germination of such species as white pine (*Pinus strobus*), white spruce (*Picea glauca*), black spruce (*Picea mariana*), and tamarack (*Larix laricina*) which commonly have dormant embryos.[2,3] Trials in a Texas nursery also have shown favorable results from cold-soaking seed of loblolly pine (*Pinus taeda*) which normally is cold-stratified before sowing.[4] It appeared likely, therefore, that cold-soaking would speed up the germination of jack pine seed.

Recently it became necessary to test 30 jack pine seed lots from various sources. A quick test of viability was necessary as a basis for distributing the seeds to three nurseries. Accordingly samples of each lot were cold-soaked for 7 days at 41 degrees F. in cheesecloth bags immersed in tap water. Germination was then tested in petri dishes at temperatures fluctuating from 68 degrees (night) to 86 degrees F. (day).

Because seed supplies were limited, untreated controls could not be spared for most lots. However, such controls were tested for one Michigan source and for a composite lot of Michigan, Wisconsin, and Minnesota seed. Results showed that cold-soaking did improve both the rate and amount of germination (Table 1). Rather complete germination of the cold-soaked seeds was available 8 days after the test began as compared to 15 days for the untreated seed. If the 7 days of treatment are added to the germination period, there is no saving of time from treatment. The total real germination, however, was somewhat better for the cold-soaked seed. The peak of the germination rate (germinative energy) was reached in 2 days for the cold-soaked seed and in 4 days for the untreated seed.

TABLE 1.—CHARACTERISTICS AND GERMINATION OF JACK PINE SEED SAMPLES

Seed lot	Cleaned seed per pound	Purity	Soundness	Treatment	Real germinative energy		Real germination	
	No.	*Percent*			*Percent*	*Days*	*Percent*	*Days*
Michigan	131,853	86.8	91	None	50	4	88	15
				Cold-soaked	49	2	96	8
Composite	142,492	83.9	74	None	26	4	70	15
				Cold-soaked	52	2	94	8

It appears from these limited tests that 7 days of cold-soaking are about as effective as past experience has shown 30 days cold stratification to be in improving jack pine seed germination.

Although there seems to be no good reason for altering the present general practice of sowing jack pine seed untreated, cold-soaking can be useful in those special cases where rather complete germination is wanted very quickly after sowing.

PAUL O. RUDOLF,
Forester, Lake States Forest Experiment Station, St. Paul, Minn.

[1] U. S. Forest Service. Woody-plant seed manual, U. S. Dept. Agric. Misc. Pub., 654: 260-275 (*Pinus*). 1948.

[2] Rudolf, Paul O. Cold soaking — A short-cut substitute for stratification. Jour. Forestry 48: 31-32. 1950.

[3] Crossley, D. I. and L. Skov. Cold soaking as a pregermination treatment for white spruce seed. For. Branch, Canada Dept. of Res. and Dev. Silvicultural Leaflet 59. 1951.

[4] Correspondence of May 12 and October 26, 1951, from Don Young, Texas Forest Service; on file Lake States Forest Exp. Sta.

Loblolly Pine Shows Early Differences with Source of Seed and Locality of Planting

The recent activation of the Southern Forest Tree Improvement Committee reflects aroused interest in the subject of forest genetics. An exploratory test of racial strains in loblolly pine shows progress in the first two years.[1] Cooperators on the test are three branches of the Southern Forest Experiment Station, one branch each of the Southeastern and Central States Stations, and the Tennessee Valley Authority. The test deals with standard loblolly pine stock from TVA nurseries. The design prescribed units of 16 seedlings of 9 sources planted in 3 blocks in each of 8 localities.

The 2-year development of loblolly pine in the 4 localities for which planted heights are available appears in Table 1. Analyses

TABLE 1.—TWO-YEAR DEVELOPMENT OF LOBLOLLY PINE FROM VARIOUS SOURCES PLANTED IN FOUR LOCALITIES

Grouping	Two-year Height (adjusted)	Survival
	Feet	*Percent*
Sources of seed		
Alabama—north	3.3	92
Alabama—central	2.9	91
Tennessee—east	2.9	84
Georgia—north	2.9	97
Mississippi—north	2.8	73
Mississippi—central	2.7	82
Maryland—east	2.3	83
Virginia—east	2.3	71
Locality of planting		
Birmingham, Ala.	3.3	86
Union, S. C.	2.3	78
Norris, Tenn.	2.8	86
Harrison, Ark	2.7	81

[1] Reports issued on the establishment, first-year and second-year progress on this test are available in limited numbers, from TVA Division of Forestry Relations, Norris, Tennessee.

brought out statistical significance for the results: (1) Both height and survival differed by source of seed and by locality of planting. This variation was consistent—with no significant interaction of source and locality. (2) Total height is correlated with survival ($r=0.46$, $df=30$). (3) Total height varies as planted height—which reflects differences in size of planting stock. To eliminate this influence, we adjusted total height to the average planted height of 0.5 foot in the table.

Examination of the table shows low values for the South Carolina locality. These are attributed to a drought that began late in 1949 and became serious during the 1951 growing season. The noteworthy feature of sources is the extreme difference in height between the first two and last two values. Thus the Alabama sources averaged 3.1 feet in contrast to 2.3 feet for Maryland and Virginia sources. The last two originated in the Coastal Plains. The test also affords evidence on sources farther south on the Coastal Plains: the first-year plantings for a North Carolina source and the replantings for a South Carolina source both failed utterly in all localities. The test is now replanted to a third source, from South Carolina Coastal Plains. The development of plantings from this source and from Maryland and Virginia will be followed with interest in coming years.

In the first two years this exploratory test is meeting the objective of bringing out differences between sources of seed and between localities of planting. For the proof of years we look to the experiment of P. C. Wakeley at the Southern Forest Experiment Station.[2] A new experiment by this station in cooperation with the Southern Forest Tree Improvement Committee (a group of participating forestry agencies and industries) should give future answers on the best geographic seed sources of the principal southern pines at various localities.

W. H. CUMMINGS,
Coordinator for Cooperative Loblolly Pine Seed Source Test, Norris, Tenn.

[2]Wakeley, Philip C. Geographic source of loblolly pine seed. Jour. Forestry 42: 23-32. 1944.

New Jersey Bank Promotes Tree Planting Machine

The Hunterdon County Agricultural Extension Service and the Hunterdon County National Bank in 1950 launched a major tree planting program to put to good use idle land no longer suited to other farm crops.

This small country bank on the advice of the county agricultural agent and state extension forester purchased a mechanical tree planter for about $750.

A farm custom operator acted as custodian and operator of the machine. He agreed to keep the machine in good mechanical condition, house it, transport it to the job, and operate it. The operator's charge to the farmer was $1.50 to move on to any farm and $2.50 per hour for his time while on that farm. The landowner furnished the tractor and operator to pull the tree planter. Repair and maintenance costs of the machine were borne by the bank.

Twenty-two landowners planted 125,000 trees in 209 hours at an average rate of 600 trees per hour. The best rate was about 900 trees per hour; small areas increased costs. Experience has shown that the planter will work nearly any place the tractor will go, although the operator says the machine works best in old sod.

A survey in the summer of 1951 indicated survival of about 90 percent. Furthermore, the results were regarded as satisfactory as where the work was done by hand. In reviewing the results of this operation, it is evident that where many farmers are involved the actual operation of the planting machine must be done by one individual. To let each farmer try to operate the machine invites failure. In 1952 the planting program will be doubled because the County Board of Agriculture has bought another mechanical planter to be operated for the farmers of the county on a similar basis.

Farmers throughout the state have watched the success of the tree planting program in this area. They are pleased with the excellent cooperation of these local institutions that have sponsored the program.

AUSTIN N. LENTZ.
New Brunswick, N. J.

Forest Fire Insurance

The practicability of insuring standing timber against fire will never be determined until more interest is shown in the coverage both by the timber owner and the insurance companies, it was stated by Billy B. Lastinger, Valdosta, Ga. member of the executive committee of the Georgia Association of Insurance Agents, before a recent meeting of the Forest Farmers Association Southern Conference at Chattanooga.

Although hoping that there will be an increasing interest in the subject by both parties, Mr. Lastinger said the amount of insurance written today on standing timber is insignificant because the actual need has not been felt, the rates have been too high, and insurance companies have not been interested because of a lack of information and a reluctance to branch out in this relatively new type of coverage.

One of the factors that may help increase the demand for insurance on forest land, Mr. Lastinger said, is the trend of some of the pulp and paper mills toward long term leases on sizable tracts of timber. The need for insurance could quite easily develop if the landowner wished to borrow money by putting up the lease as collateral. Also, if the lease is not canceled in the event of fire, the paper mill should be interested in insurance.

Insurance companies and other

interested parties need additional information to help them in arriving at fair and equitable rates as well as developing policy forms for insuring timber in the South, he said.

Starting from a basic rate, he explained, additional charges would no doubt be made in the event cutting operations were being carried on in the tract being insured, as well as a charge for conflagration hazard where extensive acreage in one tract was not broken by natural barriers. From this would be deducted various credits, presumably, such as credits for fire breaks, plowed fire lines, fire protection, fire towers, radio equipment, and fire fighting crews.

Recounting some of the efforts made in insuring standing timber, Mr. Lastinger said:

"Today there are a few of our large stock insurance companies writing limited amounts of insurance on forest land. Most policies have been written on a deductible basis with the amount of the deductible ranging from $5,000 to $250,000.

"No insurance to my knowledge has ever been written on southern pine timberland. Such coverage has been confined mainly to the forests of the Pacific Coast, Canada, and the New England states. Rates have varied from $1.00 to $2.50 per hundred dollars of value.

"The most recent insurance policy written on standing timber was issued by the General Insurance Company of Seattle covering a loan made by the Travelers Insurance Company to the Southern Oregon Sugar Pine Company. The policy covered the mortgagee's interest only for the amount of the loan, which was around $1.5 million dollars. The premium was based on a rate of 1 percent of the mortgage loan value at the beginning of each year. The policy also had a $250,000 deductible clause that was accumulative or could apply on one loss.

"Other insurance companies that have written timber insurance are the Phoenix Assurance Company, which began writing in the Pacific Northwest about 35 years ago but gave up after a few years, and the Home Insurance Co. in the same territory on timber but not on timber plantations.

"The Hartford Fire Insurance Co. has been writing a similar type of insurance for a number of years and even included young trees and plantations, but on a very limited basis with not over $25,000 in values subject to one fire.

"Our agency has worked with representatives of the American Insurance Co. and the Hartford Fire Insurance Co. for some time in trying to develop rates and forms for insuring timberland and also the lease-holders interest in tracts of land leased for naval stores purposes. This was developed to a point of being ready for the market prior to World War II, but due to the uncertainty of conditions at that time, further plans were abandoned.

"I understand that Lloyd's of London would be interested in insuring standing timber in the United States, but that a maximum of $25,000 would apply. A basic rate of $1 for the New England states was suggested, and $2 or $3 in the West and South. The policy could also be written on a deductible basis at a substantial reduction.

"Over the years several mutual fire insurance companies have been organized to insure timberlands in the Northwest and the Northeast, on a local basis. Among them was the Timberlands Mutual Fire Insurance Co. of New Hampshire, which began operations around 1917 but gave it up within two years."

European Larch Plantation

The "Idding" European larch plantation is located at Brighton, Montgomery County, Maryland. This plantation serves as an indicator of the potentialities of this species for reforestation through the Piedmont soil section of Maryland.

The seedlings were planted in 1880 on a 1/5-acre area. The site is relatively flat and the soil is classified as Cecil stony clay loam. The seedlings were originally spaced at a 6 by 6 feet spacing. The plantation now consists of 22 trees which average 18 inches d.b.h. and 85 feet in total height. The form class is 84 and the total volume 11,101 board feet (Intern. ¼-inch rule) or 55,505 board feet per acre.

The plantation has passed its economical rotation (50-60 years). Increment borings showed very rapid growth the first 25 years.

ROBERT R. BUSHMAN,
Lemitwood, Inc.
Baltimore, Md.

First Use of Radio in Fire Control?

"Wireless telegraphy has been brought into use in connection with protection of forests from fire. It is now possible for rangers in the remote regions of The Pas and Fort Churchill to communicate almost instantly with the Forestry Branch at Ottawa. This is probably the first practical application of wireless telegraphy to forest fire protection in America or elsewhere."—*Forestry Quarterly*, September 1914.

Reviews

The Future of Our Natural Resources.

Edited by Stephen Raushenbush. 275 pp. American Academy of Political and Social Science, Philadelphia 4, Pa. 1952. $2.

A total of 24 articles has been collected in the May 1952 issue of *The Annals*, the bimonthly publication of the American Academy of Political and Social Science, to form this book. These papers were written by recognized specialists, and are therefore of more than casual interest and importance.

Dr. Rausenbush, who is consultant to the Public Affairs Institute, keynotes the subject with an introductory statement on "Conservation in 1952." It is followed by "The Conservation Movement" by Robert O. Beatty of the Izaak Walton League; and "The Citizen's Part in Conservation" by John H. Baker of the National Audubon Society.

There are five articles under the general subject of forests. S. T. Dana's paper "Private Forestry in Transition" is a splendid resumé of the topic, as are also T. D. Stevens' "Tree Farms Versus Regulation," and Hardy L. Shirley's "Forest Policy for the Years Ahead."

Daniel L. Goldy in his article "'Big' Versus 'Little' Lumber Operators in the Pacific Northwest" approaches his subject with the Olympian assurance of one who, having spent his entire career on the public payroll, knows exactly how the forest products industries should be operated. Likewise, he discusses forest economics and sustained-yield management with all the certainty of opinion of one who never studied forestry.

Foresters, and in particular forest economists, might be interested in the chapter "A Program for the Redwoods" by Dewey Anderson, executive director of the Public Affairs Institute, of Washington, D. C. Dr. Anderson submits a proposal, based on a previous publication of his issued by the Institute, under which operation of the redwood forests of California would be removed from the management of the present private owners and turned over to the U. S. Forest Service. This transition would be accomplished by the establishment of a National Redwood Forest Corporation, financed through loans of $125,000,000 from the Reconstruction Finance Corporation; the forest lands would then be purchased from these funds and assigned to the Forest Service for operation.

Says Dr. Anderson, "The lumbering companies of California, I am certain, would make more money over a sixty-year period by welcoming and accepting the intensive forest management which has been proposed than they will by objecting to it and going on as they are at present. And if the stockholders of these companies want funds to pass on to their children, they would probably get more after taxes for that purpose under my proposal than they will get under present practices." Although first offered in 1949, there is as yet no recorded instance of any California lumbering companies having welcomed and accepted Dr. Anderson's proposal.

In addition to the section on forests, this publication has parts on mineral and energy resources, soils, and water resources. A chapter of special significance to readers interested in land use is "Comparative Costs of Restoration and Reclamation of Land" by Paul B. Sears of Yale. Another is "Labor Looks at Conservation and Development" by Anthony Wayne Smith of the C.I.O.

There is a certain connotation of "viewing with alarm" running through this volume, which is perhaps inevitable in a compilation by authors with such diverse viewpoints. It reminded this reviewer of the fat boy in *Pickwick Papers* who startled the old lady by saying, "I wants to make your flesh creep."

HENRY CLEPPER.

Upon Its Own Resources.

By Lawrence L. Durisch and Hershal L. Macon. 136 pp. University of Alabama Press. 1951. $3.

This book is the result of a meeting held in 1944, for the purpose of discussing the regional aspects of public administration in the South. In 1945, the state universities in six southern states and the Tennessee Valley Authority began a study on the administration of governmental problems concerning the natural resources of the South. Since 1947 separate reports on six states have been published. Durisch and Macon now bring together these individual state reports into a concluding volume.

Here is a fine example of cooperative study of regional problems, with appraisals of the situation, together with recommendations for improving the administration of the resources.

The region presents great resource potentialities. It has productive land, long growing seasons, adequate precipitation, abundant fuel and water power resources, recreational advantages, with acceptable surface and ground water supplies. But largely through apathy and waste the full potentialities of the region are far from being achieved.

Urgent need is stressed for the development of a comprehensive and balanced approach to the resource problem. The development of resource activities, while making steady progress, has not followed a fixed pattern. The suggested approach is to attack the problem in its entirety, not merely by a resource-by-resource basis.

Numerous state agencies share the responsibility of resource management. Similarly, a large number of federal agencies deal with resource problems at the state and local levels. The existence of so many separate resource agencies is an invitation to misunderstandings, conflicts, and duplications. Administration and probably technical

practices are not sufficiently coordinated for the planning and development of the region's natural resources. Lack of integration is blamed for much of the uneconomical resource development and use.

The report presents a very thorough analysis of administrative management, including organization and leadership, personnel and financial administration, and reporting. Emphasis is placed upon the "need for clear lines of authority running from the Governor down through the administrative hierarchy," for effective personnel, adequate program planning, and an overall financial and performance plan.

New and expanding problems of resource development and management present themselves with unprecedented complexity. The importance of strengthening public programs for resource improvement are increasingly urgent.

This appraisal of the natural resource problems of a region and recommendations for improvement should interest everyone in the conservation field, including government officials, educators, industries, bankers, and the public in general. It has application nation-wide, as well as for the states included in the study.

CHAS. H. FLORY,
S. C. State Commission of Forestry.

The Black Hills: Mid-Continent Resort.

By Albert N. Williams. 130 pp. Illus. Southern Methodist University Press, Dallas 5, Texas. 1952. $2.50.

Those who contemplate visiting the Black Hills should certainly read the book. Albert N. Williams has given a very readable resumé and guide of the area. The six chapters cover the Forbidden Land, Geological History, the Hills Today, Indians and Gold, Deadwood Days, and the White River Badlands.

Paha Sapa (Black Hills), one hundred miles long and fifty miles wide, with elevations up to 7,242 feet, is a forested island in the northern Great Plains. It lies in western South Dakota and eastern Wyoming. This last frontier that was at first, by Indian treaty, taboo to white man is now easily accessible by automobile and airline.

From limestone caverns, through pine clad forests, and granite needles, the area offers numerous scenic attractions to the tourist. Man-made lakes such as Sylvan, Doran, Sheridan, and Deerfield offer boating and fishing. Parks such as Custer State Park offer a wide variety of attractions and accommodations. Gigantic sculptoring at Mount Rushmore and Crazy Horse attracts visitors from all corners of the world. Accessible mountain tops offer vistas into three states. The forested hills offer a wide variety of wildflowers. Deer are very abundant. The streams are popular with fishermen.

The author gives a very good description of the legends of the hills. This includes the history of gold from its discovery in 1874 to the present day world famous Homestake mine at Lead, South Dakota. Indian massacres, uprisings, and battles climaxing at the Little Bighorn; the opening of the Hills to the white man; stage coaches, road agents, and shotgun messengers; Preacher Smith; Wild Bill Hickok, Calamity Jane, Deadwood Dick, and others have greatly contributed to our national folklores. These legends and memories are perpetuated by pageants and celebrations throughout the summer. The pageants range from "Gold Discovery Days" at Custer to the "Days of '76" at Deadwood.

The book recommends that any trip to the Black Hills should include a tour through the White River Badlands southeast of Rapid City. Here, heavy erosion has opened up the earth's history going back some 60 million years. In addition, the Badlands are also noted for the fossil beds. More than 250 different prehistoric animals have been discovered fossilized in the area.

C. C. AVERILL,
Deadwood, South Dakota.

Wood Conservation Bibliography.

By J. Hugo Kraemer. 77 pp. Superintendent of Documents, Washington 25, D. C. 1952. 40 cents.

Listed as Domestic Commerce Series No. 30, this publication has been issued by the Office of Industry and Commerce, U. S. Department of Commerce. Essentially, it is a selection of references in the field of production and utilization of lumber and other wood products.

Listed are major articles, bulletins, and other references covering production, properties, treatment and use of wood and wood products. The material is arranged in ten subjects-matter sections, alphabetically by author.

The principal purpose of the bibliography is to enable government and industry to obtain better use of wood during a time of national emergency. The author is engaged in promoting wood conservation for the Lumber and Wood Prodcurts Division of the National Production Authority.

Far Corner: A Personal View of the Pacific Northwest.

By Stewart H. Holbrook. Macmillan Company, New York, N. Y. 1952. $3.75.

No graybeard, Stewart H. Holbrook yet rates as an oldtime river pig of the New England woods. He was a boy on the drives, for in his early day as a lumberjack there were no laws to speak of against child labor. So he was fit to be a youthsome top sergeant in World War I, then a seasoned young logger in the tough shows of British Columbia.

Books were in Holbrook's head as early as 1920. They've been surging from him since 1936. In his latest, *Far Corner—A Personal View of the Pacific Northwest*, the personal appearances of the author in its varieties of story and essay yield the best pages. He takes you into an ancient logging camp bunkhouse and does not let you miss a

smell. He breaks a trail through young Douglas-fir to a stump rancher's abandoned shack and has you read the 40-year-old newspapers on the wall.

The big timber and its business and labor loom and shine all through *Far Corner*, except in the chapters on the Heppner flood, the Walla Walla legend of the rawhide railroad, and other east of the mountains locations. The big chapter of the book, and the last one, deals entirely with "The Changing Forest." It has points of view that are sure to bug the eyes of many dedicated Holbrook readers in New York, Boston, and Philadelphia. Here's a sample:

"The city man commonly thinks of the forest as being a remote and savage place where nothing moves, nothing happens. The woodsman knows better. He knows the forest to be as busy a place as Manhattan at its peak hours of rush, a place of intense activity. No classified page could possibly list its daily births and deaths. No column could begin to record its fires and other disasters. The worst human barbarian could scarcely believe the ferocious warfare constantly waged in its shadows."

Our rugged author then tells the grim tale of beetle and budworm wars on trees of the region and paints the evil of the hemlock looper. He makes it clear how the forest survives the worst that men and bugs can do to it:

"What drove them (stump ranchers) from their hard-won acres was the appalling energy and power of the reviving forest, the second growth. You could hardly turn your back on a newly cleared field without the ferns and the fireweed marching across it. After them, and quickly, came the alders —and the firs, hemlocks, and cedars."

The new Holbrook book has many prime stories with bark on them. One tells how Mrs. Cliff Rice of Satsop came to receive 492 letters of menace and curse after a story of her tree seed business was published nation-wide. She was doing fine in gathering seeds for the West Coast Lumbermens Association's Nisqually nursery and was rightly proud of it. However, the story told that sometimes the cone caches of squirrels were gleaned by the seed harvesters. "Squirrel starver!" was the least of the denunciations hurled by mail at Mrs. Rice by gentle animal lovers from 48 states.

That news story was from an idea of mine. I've been mighty careful on the handling of animal items ever since. Holbrook's account of the business is, of course, amusing and lively, but for me it revived the grim sight of that mountain of abusive letters from so-called human beings.

Well, that's *Far Corner* for any Northwesterner—a book to stir up memories that are colorful and exciting in one way or another.

JAMES STEVENS.

Forest Management.

By H. Arthur Meyer, Arthur B. Recknagel and Donald D. Stevenson. 290 pp. Illus. The Ronald Press Co., New York. 1952. $6.

This newly published textbook is designed for use in teaching regulation aspects of forest management at the professional level. It should be of primary interest also to all foresters engaged in the direct management of timberlands.

It is excellently written, clear, direct, and easy to understand. The viewpoints and information are current, and emphasize the marked evolution which has taken place in American forest management practices during the past ten years. Organization of the text is pointed toward the preparation of the management plan. In this respect the authors have drawn a fine line to exclude from detailed discussions related information in the fields of silviculture, utilization, protection, economics, etc. From the viewpoint of the teacher this is a strong point in favor of the text for it defines explicitly the field of forest management and discussions are confined to this limited field. That is the reason why the text has only 290 pages and yet handles very adequately the information needed for forest regulation.

There are four parts to the book. The first by way of introduction is very brief, but to the point, and considers the scope, objectives, history, and present status of forest management. Part two is on general organization of forest property for management, and is concerned with surveys, maps, and classes of forest conditions, growing stock and growth, development and improvement of forests, with also a chapter on business aspects.

The third part is forest regulation and includes a fine treatment of normal forest concepts. Methods of regulating the cut are realistic and practical. Here the authors contribute much in bringing regulation to a sound, applied basis.

Part four deals with management plans and constitutes almost a third of the total number of pages. Specimen management plans are presented for small as well as for medium and large forest areas. These are well selected and should be an excellent means of getting across to the student the principles and contents of management plans.

For a 3 credit course under the quarter system this text should be ideal. The teacher probably would wish to use supplemental material if the course were on a semester basis.

MERRILL E. DETERS,
University of Idaho.

Current Literature

Compiled by MARTHA MEELIG, *Librarian, The New York State College of Forestry*

Range Management Section Compiled by FRANCES FLICK, *Library, U. S. Department of Agriculture*

General

British Guiana Timbers. Leaflet 1-13. British Guiana Forest Dept. (Each number on a single species—tree and wood). 1951.

Common Trees of Pennsylvania. 55 pp. Illus. Pennsylvania Dept. of Forests and Waters, Div. of Forest Research. 1952.

Forest Laws of Oregon; History of Forest and Fire Laws; Summary of Forest Conservation Act. 36 pp. Western Forestry and Conservation Assoc. Portland, Oreg. 1952.

Forestry Employment; Employee Regulations . . . 54 pp. California Div. of Forestry. 1952.

4-H Projects in Forestry and Wildlife. By A. N. Lentz. 4 pp. Illus. New Jersey Ext. Serv., College of Agric., Rutgers Univ., New Brunswick, N. J. Leaflet No. 75. 1952.

Uncle Sam in the Pacific Northwest. By Charles McKinley. 673 pp. Illus. Univ. of California Press, Berkeley. 1952. $7.50.

Wisconsin's Forests. By J. N. Fisher, A. W. Jorgensen and H. C. Allman. 24 pp. Information and Educ. Div., Wisconsin Conservation Dept., State Office Bldg., Madison 2, Wis.

Forest Economics

Forest Yield Taxes. By R. W. Marquis. 50 pp. U. S. Dept. of Agric., Washington 25, D. C. Cir. No. 899. 1952. 20 cents (Govt. Print. Off.)

Forest Management

Controlled Sampling for Aerial Photo Timber Cruises. By F. D. Brunson and C. E. Jensen. 3 pp. Central States Forest Expt. Sta., Columbus 15, Ohio. Station Note No. 66. 1951. Processed.

Marking Guides for Oak and Yellow Poplar in the Southern Uplands. By J. L. Burkle and Sam Guttenberg. 27 pp. Illus. Southern Forest Expt. Sta., New Orleans, La. Occasional Paper No. 125. 1952. Processed.

A Method of Measuring Increase in Soil Depth and Water Storage Capacity Due to Forest Management. By G. R. Trimble, Jr. 8 pp. Northeastern Forest Expt. Sta., Upper Darby, Pa., Station Paper No. 47. 1952. Mimeog.

Timber Cruising on Aerial Photos. By K. E. Moessner and C. E. Jensen. 27 pp. Central States Forest Expt. Sta., Columbus 15, Ohio. Tech. Paper No. 126. Processed. 1951.

Forest Resources

Forest Statistics for Vermont. By J. R. McGuire and R. D. Wray. 47 pp. Northeastern Forest Expt. Sta., Upper Darby, Pa. 1952. Mimeog.

Forest Statistics of Southern Indiana. 40 pp. Central States Forest Expt. Sta., Columbus 15, Ohio. Forest Survey Release No. 10. 1951. Mimeog.

Logging and Milling

Log Grade Classification Based on Standard Lumber Recovery for Inferior Upland Hardwoods in East Texas. 34 pp. Illus. Texas Forest Serv., Lufkin. Tech. Report No. 4. 1952.

Survey of Sawmill Residues in East Texas. By W. W. King. 39 pp. Illus. Texas Forest Serv., Lufkin. Tech. Report No. 3. 1952.

Protection

Airplane Spraying for Forest Pest Control. By J. S. Yuill and C. B. Eaton. 20 pp. U. S. Bur. of Entomology and Plant Quarantine, Washington 25, D. C. E-823. 1951. Mimeog.

The Control of Termites and Insects Mistaken for them. By J. O. Pepper and S. G. Gesell. 14 pp. Illus. Pennsylvania State College, State College. Cir. No. 400. 1952.

Range Management

Improving California Brush Ranges. Revised. By R. M. Love and B. J. Jones. 38 pp. Illus. California Agric. Expt. Sta., Berkeley. Cir. No. 371. January 1952.

Influence of Mechanical Treatment on Germination and Longevity of Seed of Various Grasses. By J. L. McWilliams. 7 pp. U. S. Soil Conservation Serv., Region 5, Lincoln, Nebr. 1952.

Medusa Head, a Problem on Some Idaho Ranges; a Preliminary Study. By L. A. Sharp and E. W. Tisdale. 9 pp. Idaho Univ., Forest, Wildlife, and Range Expt. Sta., Moscow. Research Note No. 3. May 1952. Mimeog.

Photography as a Means of Recording Vegetation Changes in Pastures. By H. H. von Broembsen. South African Jour. of Sci., Johannesburg. Vol. 48. pp. 235-238. Illus. February 1952.

Silviculture

Chemical Control of Weeds in Forest Nursery Seedbeds. By G. D. Holmes. 31 cm. Illus. Great Britain Forestry Comm., London. Forest Record No. 13. 1952. 2*s.* 0*d*

Guide for First Thinning of Plantations of Loblolly and Shortleaf Pine. By K. D. Lane. 7 pp. Chart. Tennessee Valley Authority, Norris. Tech. Note No. 9. 1952. Mimeog.

Hereditary Variation as the Basis for Selecting Superior Forest Trees. By K. W. Dorman. 88 pp. Illus. Southeastern Forest Expt. Sta., Asheville, N. C. Station Paper No. 15. 1952. Mimeog.

Here's How . . . A Guide to Tree Planting in the California Pine Region. By C. W. Corson and H. A. Fowells. Illus. by A. E. Kursinski. 26 pp. California Forest and Range Expt. Sta., Berkeley. Misc. Paper No. 8. 1952. Processed.

Les Pépinières Forestières au Maroc. By A. E. Metro. 68 pp. Protectorat de la Republique Francaise au Maroc. Div. des Eaux et Forest. Sta. de Rec. et d'Exp. For. Brochure Tech. No. 1. 1951.

Tree Farms

The American Tree Farm System. Folder. American Forest Products Industries, Inc., Washington 6, D. C.

Georgia Tree Farms System. Folder. Georgia Forestry Comm., Atlanta.

Wood Technology and Utilization

Chemical Seasoning of Oak and Gum Lumber. By E. D. Marshall. 28 pp. Illus. Texas Forest Serv., Lufkin. Tech. Report No. 2. 1952.

Moisture Content Changes in Seasoned Lumber in Storage and Transit. 16 pp. Illus. Minister of Resources and Development, Ottawa. Vancouver Lab. Bul. No. 102. 1952.

The Steam-Bending of Beech. By F. W. Wangaard. 26 pp. Illus. Northeastern Tech. Committee on the Util. of Beech in coop. with Northeastern Forest Expt. Sta., Upper Darby, Pa. Beech Util. Ser. No. 3. 1952. Mimeog.

Storage of Beech Logs and Bolts in the Northeast. By T. C. Scheffer and R. A. Zabel. 13 pp. Illus. Northeastern Tech. Committee on the Util. of Beech in coop. with Northeastern Forest Expt. Sta., Upper Darby, Pa. Beech Util. Ser. No. 2. 1951. Processed.

Wood. 176 pp. Illus. Great Britain Dept. of Sci. and Indus. Research, London. Selected Govt. Research Reports No. 8. 1952. 1£ 1*s.*

Wood Conservation, Bibliography. By J. H. Kraemer. 77 pp. U. S. Dept. of Commerce, Washington 25, D. C. 1952. Domestic Commerce Ser. No. 30. 40 cents (Govt. Print. Off.)

Society Affairs

Officers and Members of the Council, 1952-1953

GEORGE L. DRAKE, *President*
Simpson Logging Company
Shelton, Wash.

WILLIAM J. BROWN
Woodlands Department
Kimberly-Clark Corporation
Neenah, Wis.

D. B. DEMERITT
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6 State Street
Bangor, Me.

FRANK H. KAUFERT
School of Forestry
University of Minnesota
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ELWOOD L. DEMMON, *Vice President*
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Station, Federal Building
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GORDON D. MARCKWORTH
College of Forestry
University of Washington
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RICHARD E. MCARDLE
Forest Service
U. S. Department of Agriculture
Washington 25, D. C.

HENRY CLEPPER, *Executive Secretary*
Mills Building, 17th Street at Pennsylvania Avenue, N. W.
Washington 6, D. C.

EARL PORTER
Southern Kraft Division
International Paper Company
Mobile 9, Ala.

PERRY A. THOMPSON
12 Elkin Court
San Rafael, Calif.

RUTHFORD H. WESTVELD
Department of Forestry
University of Missouri
Columbia, Mo.

Schedule of Events of Joint Meeting Canadian Institute of Forestry and Society of American Foresters

There follows a complete schedule of events for the joint C.I.F.-S.A.F. meeting in Montreal on November 17-20. In the September issue will appear the programs of topics and speakers for each session.

Members of the C.I.F. and S.A.F. are welcome to attend all open meetings, including the technical sessions. Although the meeting officially begins on Monday, November 17, the only open session that day is the technical session on forestry education, primarily of interest to those engaged in professional forestry instruction. The first (opening) general session is scheduled for the morning of Tuesday, November 18.

Monday, November 17

Technical Sessions on Forestry Education: morning and afternoon.

Executive Session, S.A.F. Council: morning and afternoon.

Business Meeting, C.I.F. Board of Directors.

Joint Dinner, S.A.F. Council and C.I.F. Board of Directors: evening.

Tuesday, November 18

First joint General Session: morning.

Joint Luncheon of the two Societies: noon.

S.A.F. Society Affairs Session: afternoon.

C.I.F. Annual Business Meeting: afternoon.

Ladies reception and tour of the city: afternoon.

Forestry school alumni meetings: dinner and evening.

Motion pictures, U.S. and Canadian forestry: evening.

Wednesday, November 19

Technical Sessions on Forest Management: morning and afternoon.

Technical Sessions on Silviculture: morning and afternoon.

Technical Session on Forest Economics and Taxation: morning.

Ladies' fashion show: afternoon.

Reception and Dinner of the two Societies: evening.

Thursday, November 20

Technical Session on Wood Utilization: morning.

Technical Session on Recreation, Wildlife and Range Management: morning.

Technical Session on Public Relations: morning.

Second (final) General Session: afternoon.

Hotel Reservations

In requesting hotel reservations, members should state that they are attending the joint meeting of the Canadian Institute of Forestry and the Society of American Foresters.

Usually reservations are not held after 6 p.m., hence guests who expect to arrive after that hour should obtain confirmation from the hotel that rooms will be available. Usually, the number of rooms at the minimum rate, especially single rooms, is limited, hence hotels may confirm reservations at the next highest rate, if no room is available at the rate requested.

Since rooms with twin beds will be easier to obtain than single rooms, members are urged to team up when possible. Moreover, the rate per person may be less. Early reservations are advised.

Remember that the first general session opens on the morning of November 18. The first technical session—forestry education—will be held on November 17; this will be the only open meeting on November 17.

Mount Royal Hotel

The headquarters hotel for the meeting is the Mount Royal, 1455 Peel Street. This hotel contains 1100 rooms and adequate accommodations are assured for all those who wish to attend. Daily rates are as follows:

Single room with bath: $6, $6.50, $7.50, $8.50, and $9.50

Double-bed room with bath for two: $9, $9.50, $10.50, $11.50, and $12.50.

Twin-bed room with bath for two: $9.50, $10.50, $11.50, $12.50, and $14.50.

Three persons in two rooms with bath: $15, $16, $19, and $21.

Three persons in one room with bath: $13.50, $14.50, and $15.50.

Suites for two persons: $21, $22, $24, and $28.

Other Hotels

Affiliated with the Mount Royal is the Laurentian Hotel, located at Dorchester and Windsor Streets, on Dominion Square. The Laurentian is five blocks from the Mount Royal, within easy walking distance. It is a large modern hotel (1000 rooms). The rates are $5 up for single room with bath; $8.50 up for double room with bath.

Other good hotels in Montreal, all within a ten-minute walking distance of the Mount Royal, are the following:

The Windsor Hotel (700 rooms), Windsor and Dorchester Streets, is four blocks from the Mount Royal. Rates are $6 up for single room with bath; $9 up for double.

The Queen's Hotel (500 rooms), Windsor and St. James Streets, is six blocks from the Mount Royal. It is a less expensive hotel. The rates are $4 up for single room with bath; $7 up for double.

Hotel Berkeley (100 rooms), 1188 Sherbrooke Street West; four blocks from the Mount Royal. The rates are $4.50 up for single room with bath; $8 up double.

Hotel de La Salle (175 rooms), 1240 Drummond Street; five blocks from the Mount Royal. Rates are $5 up for single room with bath; $8 up double.

Montreal has other hotels and numerous tourist lodges. Lists of these may be obtained from the Montreal Tourist and Convention Bureau, 923 Dominion Square Building, 1010 St. Catherine Street West.

Meeting Committees

All arrangements for this international meeting are under the general chairmanship of W. A. E. Pepler, Canadian Pulp and Paper Association, 2280 Sun Life Building, Montreal 2, Quebec, Canada. Assisting him as vice chairman is Henry Clepper for the Society of American Foresters.

Program Committee

The Program Committe has been assigned the duty of arranging for topics and speakers for the two general sessions, and for correlating the programs of the technical sessions. The chairman is J. L. Van Camp, Canadian Forestry Association, 4795 St. Catherine Street West, Montreal 6, Quebec, Canada. Assisting as vice chairman and representing the S.A.F. is Hardy L. Shirley, College of Forestry, State University of New York, Syracuse 10, N. Y.

Advance Information

A committee on advanced information has been assigned the duty of providing the members of the two societies with notices of the meeting, the program, and other scheduled events through the *Forestry Chronicle* and the *Journal of Forestry*. Information is also being made available to other technical, trade, and conservation magazines.

Representing the C.I.F. as chairman of this committee is J. F. Rivard, Canadian International Paper Company, 1456 Sun Life Building, Montreal 2, Quebec, Canada. Henry Clepper is co-chairman for the S.A.F.

Reception Committee

The chairman of the Reception Committee is R. L. Campbell, Canadian International Paper Company, Sun Life Building, Montreal 2, Canada. The co-chairman, representing the S.A.F., is William C. MacAdam, Francestown, N. H.

Registration Committee

A special registration table will be available where all members of the two societies, their ladies, and guests may register and obtain information. Chairman of this committee is D. V. Love, Secretary of the Canadian Institute of Forestry, 10 Manor Road West, Toronto, Ontario. The co-chairman is Miss L. A. Warren, business manager of the S.A.F.

Awards Committee

A committee on Awards has been asked to arrange for the presentation of awards for outstanding achievement and distinguished service to forestry. Dr. R. E. Balch, past president of the Canadian Institute of Forestry, Fredericton, N. B., represents the C.I.F. on this committee. Henry Clepper represents the S.A.F., acting for George L. Drake, president.

Side Trips

A special committee has been appointed to prepare information about points of interest along the main travel routes to Montreal in order that foresters may visit woods and industrial plants before or after the meeting. Later announcements will provide specific information as to the location of mills, forestry operations, and laboratories with instructions how to reach them.

The chairman of this committee is Bruce Logan, Howard Smith Paper Mills, 407 McGill Street, Montreal. The vice chairman is C. S. Herr, Brown Company, Berlin, N. H.

Entertainment Committee

An Entertainment Committee, to arrange for the reception and entertainment features of the meeting, consists of a representative from each of the two societies. The chairman is I. F. Fogh, Canadian International Paper Company, Sun Life Building, Montreal 2, Canada. The vice chairman is R. E. Broderick, Northeastern Lumber Manufacturers Association, 271 Madison Avenue, New York 16, N. Y.

Hotel Arrangements

A special committee has made arrangements with the hotels for meeting and conference rooms, luncheons and dinners, and all other needed facilities (but not individual room reservations). Chairman of this committee is W. D. Bennett, formerly with the Canadian Pulp and Paper Association at Montreal, now resident at Rosswood, Waddington, Muskoka, Ontario.

Press and Publications

A committee has been appointed to arrange for publicity and public relations contacts during the meeting and for subsequent publication of the papers presented. K. G. Fensom, president of the C.I.F., is chairman of this committee. His address is Forest Products Laboratory, University of British Columbia, Vancouver 8, B. C., Canada. Henry Clepper will assist him as representative of the S.A.F.

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Advancement to Member Grade

There exists among Society members the mistaken idea that Juniors must remain in this grade for a specified length of time or that a nomination for advancement must be initiated by a Section in their behalf. Such is not the case. A candidate for membership may be elected to the Junior grade one day and apply (or be proposed) the following day for advancement to the Member grade, provided he meets the following requirements.

1. Three years of forestry experience since first becoming eligible for the Junior grade. (Generally, this means three years forestry experience subsequent to the date that he received his forestry degree. It does not mean three years in the Junior grade.)

2. Currently employed in forestry

work, including all activities having to do with the management of forest land and the utilization of any of its resources. (See Bylaw 6.)

3. Demonstrated competence as a professional forester.

Approximately 300 members now in the Junior grade are eligible for advancement. Junior Members who meet the requirements should not be reluctant to apply for advancement to the Member grade. Such advancement is recognition by fellow foresters of Junior Members' competence, responsibility, and professional maturity. They should not wait to be nominated. If they qualify, the should apply now through their Sections.

Report of Mid-Year Council Meeting

A meeting of the S.A.F. Council was held June 23-25 in Taos, N. Mex. Present were President George L. Drake, Vice President E. L. Demmon, William J. Brown, Frank H. Kaufert, C. Otto Lindh, G. D. Marckworth, Richard E. McArdle, Earl Porter, P. A. Thompson, R. H. Westveld, and Henry Clepper, executive secretary. D. B. Demeritt was unavoidably absent.

Appointment of Editor

After reviewing a list of candidates for the position of editor for the Society, the Council unanimously voted to tender the appointment to Arthur B. Meyer of Jefferson City, Mo.

Mr. Meyer is assistant state forester of Missouri. He was graduated in forestry in 1938 at Michigan State College, after having taken undergraduate work at the University of Missouri. Thirty-six years of age, he has had ten years of forestry experience in the C.C.C., as a district forester and farm forester with the Missouri Conservation Commission, and since early in 1949 has been assistant state forester in charge of the timber management section. During the recent war he served for three years as an officer in the Navy, and subsequently had one and one-half years in private business.

In addition he has done considerable writing for various periodicals, including the JOURNAL OF FORESTRY and *American Forests*, on forestry, conservation, and outdoor subjects.

Albert G. Hall, who has been serving as JOURNAL editor on a part-time basis since January 1950, was not a candidate for the position.

The selection of an editor was not an easy one. There were a number of candidates with excellent qualifications who had indicated an interest in the position. Mr. Meyer's selection was based on his demonstrated experience and interest in writing and editing as a career, plus his all-around competence as a professional forester.

His principal duty will be the editing of the JOURNAL OF FORESTRY, but will not be confined to work on the JOURNAL alone. He will undertake also the writing and editing of other Society publications, will assist in the preparation of professional publicity, will work with committees of the Sections and Divisions in the editing and publication of technical reports, will help individual members, when requested, in the preparation of professional papers for the JOURNAL, and will aid the executive secretary in other related activities as assigned by the Council. Concurrent with these duties, the editor will work on projects to increase the circulation of the JOURNAL.

The filling of this position on a permanent, full-time basis has been an objective of the Council ever since June 1948 when the then Council approved "the establishment of a staff office on publications with qualified personnel, as the next major expansion of the budget." (See the JOURNAL OF FORESTRY for August 1951, page 598.)

Additional information about the new editor and the services he will be available to perform for members will appear in subsequent issues. It is expected that Mr. Meyer will report for duty in the Washington office about September 1.

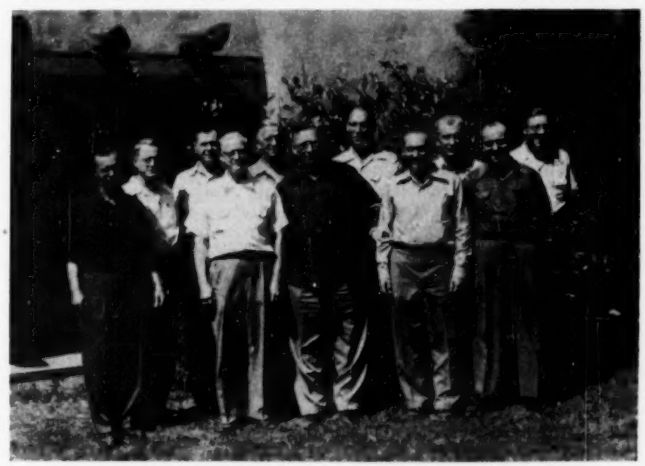
Proposed Changes in Membership Bylaws

During the past two years there has been considerable discussion of the Society's membership regulations. The principal point at issue was the effect of the Council's action in approving specific curricula offered in accredited schools for the purpose of determining which graduates are eligible for Junior Membership immediately on graduation.

At the request of the Council, the Committee on Accrediting in October 1949 recommended certain educational requirements as a qualification for Junior Membership. This recommendation was embodied in Bylaw 5, adopted by the Council at its meeting in December 1950.

Bylaw 5 defined the minimum educational qualifications for those graduates of accredited institutions who would henceforth be eligible for Junior Membership immediately upon graduation.

Considerable misunderstanding and some criticism followed. For it was found that the graduates of certain schools, who had majored in curricula which previously had been accepted as adequate for Junior Membership, were no longer eligible for the Junior grade immediately upon graduation. The reason they were no longer eligible was



Council members in attendance on Mid-year meeting.

because these special curricula did not contain the minimum basic courses which the Council, in adopting Bylaw 5, had determined were essential to a professional career in forestry.

The minimum basis professional courses are five in number: (1) silviculture, (2) management, (3) protection, (4) economics, and (5) utilization.

In essence, the dissatisfaction with Bylaw 5 centered on the criticism that these professional courses, together with certain foundation science courses which were also specified, constituted too rigid a requirement. One of its most controversial effects was that at some schools, but not all, graduates in utilization and wood technology were not eligible for the Junior grade immediately upon graduation.

At a meeting in June 1951, the Council decided not to amend Bylaw 5 at that time, but to give further study to its operation, and to invite further study by the membership at large. In order to focus attention on the subject, an open panel discussion on membership requirements was scheduled for the annual meeting of the Society in Biloxi, Miss. in December 1951.

The panel discussion was duly held. Many members participated. From the discussion it was quite evident that (1) a sizeable group of members did not understand or appreciate the need for high educational standards as a qualification for Junior Membership, the entering professional grade; and (2) a sizeable group of members, while appreciating the need for high educational standards of membership, if the Society were to continue to develop as a true professional society, believed the standards were too rigid.

As a result of this open discussion at Biloxi, the Council instructed the executive secretary to send to the Sections certain background information pertinent to the subject, and to invite the members, at their Section and Chapter meetings, to acquaint themselves with the issues. In addition, the Council requested the Sections and Chapters to try to determine the sentiment of the members on certain specific questions on which the Council desired an expression of membership opinion.

It was also decided by the Council that if a formal referendum to amend the Constitution would be found necessary, the referendum would not be held until after the members had had a full year of study and discussion.

During the period January through June, 1952, 9 Sections and 11 Chapters conducted opinion polls, based on the questionnaire sent out by the executive office. In addition, numerous helpful individual letters have been received expressing opinions. The Council urges that discussion continue in those Sections which have not yet considered the matter, as no final action will be taken until the end of the year.

Meanwhile, however, the Council has received sufficient evidence of the trend of thinking among the membership at large to propose two possible amendment to the bylaws. These amendments, it is believed, would resolve some of the more controversial issues and would compromise much of the dissatisfaction now existing.

These proposed amendments are tentative and preliminary. Although they have been carefully thought out, they are not final and are subject to discussion by the membership. The Council will review them at its meeting in Montreal on November 17, with the possibility that they may then be enacted, with such revisions, if any, as may be desirable, to go into effect as of January 1, 1953.

An explanation of the proposed bylaws follows.

Proposed Amendment of Bylaw 5

It is now evident that a considerable majority of those members who have expressed opinions approved the following policy:

1. As a qualification for Junior Membership, *immediately following graduation from an accredited school*, the applicant shall have pursued a curriculum with a minimum core of professional forestry courses.

2. These minimum professional courses shall be a requirement for all applicants *who qualify solely on the basis of education.*

3. The minimum professional courses shall continue to be (1) silviculture, (2) management, (3) protection, (4) economics, and (5) utilization.

A major source of dissatisfaction with the present Bylaw 5, particularly by the heads of some schools, is in the fact that it prescribes specific science courses as essential foundation work for the five professional courses. Actually, these foundation courses are believed to be a requirement in most, if not all, the accredited schools. But they are not in all cases listed in the curriculum exactly by name as designated in Bylaw 5. Moreover, the credits specified in Bylaw 5 are in some cases at variance with the credits assigned by the schools.

Since it is believed that no accredited school would offer one of the professional courses without suitable, preliminary, foundation courses, the Council proposes to resolve the problem by eliminating from Bylaw 5 the specific designation of such courses and their credit values.

The present Bylaw 5 is followed by the proposed amendment.

Present Bylaw 5

Requirements for Junior grade: Theoretical training in the fundamental principles of professional forestry is the basic requirement.

Junior membership is the temporary, probational, entrance grade for professionally trained foresters.

Class A. Graduates of approved curricula in institutions accredited by the Council of the Society of American Foresters shall be eligible for election to the Junior Member grade on the endorsement of three voting members. For a curriculum to be approved it must include the following professional courses:

Silviculture—3 semester units (based on ecology—3 semester units; botany, plant physiology, and dendrology—6 semester units; and soils—3 semester units);

Protection (fire, insects, or disease)—3 semester units;

Management—3 semester units (based on mensuration—3 semester units; surveying—3 semester units; and mathematics through trigonometry);

Economics—3 semester units (based on general economics—3 semester units); and

Utilization—3 semester units.

Class B. Affiliate Members who have had two additional years of qualifying forestry experience since being elected to the Affiliate grade, shall be eligible for election to the Junior Member grade on the endorsement of the Section in which the member is domiciled, provided that satisfactory evidence is submitted that during their total experience they have gained a knowledge of all the basic courses which must be included as a minimum in an approved curriculum in an accredited forestry school.

Proposed Bylaw 5

Requirements for Junior grade: Theoretical training in the fundamental principles of professional forestry is the basic requirement.

Junior Membership is the temporary, probational, entrance grade for professionally trained foresters.

Class A. Graduates of approved curricula in institutions accredited by the Council of the Society shall be eligible for election to the Junior Member grade on the endorsement of three voting members. For a curriculum to be approved it must include the following professional courses, based on suitable foundation courses:

Silviculture—3 semester units or 4 quarter units.

Protection—3 semester units or 4 quarter units.

Management—3 semester units or 4 quarter units.

Economics—3 semester units or 4 quarter units; and

Utilization—3 semester units or 4 quarter units.

Class B. (No change.)

Proposed Amendment of Bylaw 4

A concurrent question arose as a result of the Council's approving specific curricula, through the operation of Bylaw 5, as a qualification for Junior Membership. This question concerned the eligibility of graduates of accredited schools who major in curricula which do not contain all the five professional courses.

For example, graduates in utilization and wood technology in some accredited schools receive no silviculture. Such graduates are not eligible for the Junior grade; and, in fact, are not eligible for the Affiliate grade until after they have obtained a minimum of two years of qualifying experience subsequent to graduation.

In order to make it possible for such graduates to enter the Society, immediately upon graduation, the Council proposes an amendment to Bylaw 4 which would permit them to become Affiliate Members. Those who later obtained qualifying experience would be eligible for the Junior grade, and eventually the Member grade.

In some of the accredited schools students in the wildlife management and the range management curricula take as much, and sometimes more, of the professional forestry courses as the utilization and wood technology majors. Accordingly, the Council considers it equitable to include graduates in wildlife and range management from accredited schools in the proposed amendment to Bylaw 4.

Readers should keep in mind that in some accredited schools curricula in utilization, wood technology, wildlife management, and range management contain all the five professional courses, and therefore their graduates are eligible for Junior Membership under Bylaw 5. The proposed Bylaw 4 will not affect them. It is intended to provide Affiliate Membership, without an experience requirement and without a two-year waiting period, for graduates of accredited schools in the four designated curricula where these curricula do not include all five professional courses.

The present Bylaw 4 is followed by the proposed amendment.

Present Bylaw 4

Requirements for Affiliate Grade: Practical training in forestry, or in related fields in wildland management or forest utilization, but of insufficient quality or quantity to meet the requirements of the Junior Member grade, is the basic requirement.

Class A. Graduates of institutions which offer forestry curricula, but which have not been accredited by the Council of the Society of American Foresters, shall be eligible for election to the Affiliate grade provided their instruction has included the following professional courses: Silviculture—3 semester units (based on ecology—3 semester units; botany, plant physiology, and dendrology—6 semester units, and soils—3 semester units); Protection (fire, insects, or disease)—3 semester units; Management—3 semester units (based on mensuration—3 semester units, surveying—3 semester units, and mathematics through trigonometry); Economics—3 semester units (based on general economics—3 semester units); and Utilization—3 semester units.

Class B. Persons who have had at least six years of practical training, or a combination of practical and theoretical training equalling at least six years, shall be eligible for election to the Affiliate grade. Each academic term of appropriate theoretical training at ranger, vocational, or professional forestry schools may be substituted for one year of practical training up to a maximum of two years. Qualifying forestry experience, which may be considered as meeting the practical training requirement, shall be obtained while the candidate is regularly engaged in growing forests, with attendant duties such as management or protection of forest areas, supervision of silvicultural requirements in logging, erosion control, or similar forestry activities; regularly engaged in related wildland activities such as range, wildlife, or recreation management; or regularly engaged in those phases of utilization having a relation to the growing of forest crops.

Proposed Bylaw 4

Requirements for Affiliate grade: Practical training in forestry, or in related fields in wildland management or forest utilization, but of insufficient quality or quantity to meet the requirements of the Junior Member grade, is the basic requirement.

Class A. Graduates of institutions which offer forestry curricula, but which have not been accredited by the Council of the Society, shall be eligible for election to the Affiliate grade provided their instruction has included 3 semester units or 4 quarter units of each of the following professional courses: silviculture, management, protection, economics, and utilization.

Class B. (No change.) Persons who have had at least six years of practical training, or a combination of practical and theoretical training equalling at least six years, shall be eligible for election to the Affiliate grade. Each academic term of appropriate theoretical training at ranger, vocational, or professional forestry schools may be substituted for one year of practical training up to a maximum of two years. Qualifying forestry experience, which may be considered as meeting the practical training requirement, shall be obtained while the candidate is regularly engaged in growing forests, with attendant duties such as management or protection of forest areas, supervision of silvicultural requirements in logging, erosion control, or similar forestry activities; regularly engaged in related wildland activities such as range, wildlife, or recreation management; or regularly engaged in those phases of utilization having a relation to the growing of forest crops.

Class C. Graduates of institutions which have been accredited by the Council of the Society, who have majored in utilization, wood technology, wildlife management, or range management, where these curricula do not include all the five professional courses (silviculture, management, protection, economics, and utilization), shall be eligible for election to the Affiliate grade.

Other Amendments to Bylaws

Three amendments to the bylaws were approved by the Council in order to improve the administration of membership procedure and to effect economy.

Bylaw 16

Bylaw 16 reads as follows: "The names of newly elected members shall be made known to the membership, through publication in the first issue of Society Affairs succeeding the election in which they can appear."

This list is, almost without exception, a duplication of the names of candidates which are published prior to their election.

By motion of Mr. Brown, seconded by Dr. McArdle, the Council unanimously voted to eliminate Bylaw 16.

The elimination of the need for a second listing will provide much needed space in the JOURNAL. Names of applicants for Student Membership will henceforth appear in the published list of candidates.

Bylaw 19

Bylaw 19 reads as follows: "Every nomination, except of a candidate for Junior Membership who is a graduate of a school of forestry approved by the Council, must be supported by three or more letters of endorsement from voting members explaining how and why the candidate is eligible for the grade of membership for which he is nominated. In such letters of endorsement it is not sufficient for the sponsor simply to approve the candidate's election; he must in addition, on the basis of his personal knowledge of the man and his work, explain briefly and clearly how and why he believes him to be eligible under the requirements of the Constitution."

This bylaw is inconsistent in that letters of endorsement are required for applicants for Affiliate Membership (Class A) who, as graduates of non-accredited schools, are eligible immediately following graduation. Obviously, since these applicants have no experience, letters of endorsement are practically unobtainable except from the faculty of the school they attended.

Moreover, in view of the new standards for this grade, sponsor statements are not needed. If required, they would be of little value.

The same inconsistency applies to applicants for so-called automatic advancement from Junior Membership to the Member grade. Junior Members at the expiration of six years in that grade are automatically advanced to the Member grade unless they are not engaged in forestry work or their advancement is protested.

Finally, to be consistent with present membership administration, "nominations" should be changed to "applications," and "letters of endorsement" to "sponsor statements."

Upon a motion by Dr. McArdle, seconded by Mr. Lindh, the Council unanimously voted to amend Bylaw 19 to eliminate the requirement for these obviously superfluous sponsor statements. The new bylaw, as amended, follows:

Bylaw 19. Every application, except for the specific exemptions listed below, must be supported by three or more sponsor statements from voting members, who from their personal knowledge of the candidate and his work, can provide evidence of his eligibility. Sponsor statements are not required of the following classes of applicants:

1. Applicants for Student Membership.

2. Applicants for Affiliate Membership who are graduates in forestry curricula of schools which have not been accredited.

3. Junior Members eligible for automatic advancement to the Member grade.

Bylaw 23

Bylaw 23 reads as follows: "Notice of all terminations of membership shall be given to the membership at large, through publication in Society Affairs or otherwise, and the Sections concerned shall be notified."

There appears to be little value to the Society in the publication of terminations in Society Affairs. Such publication has been construed as an implied threat to those who have resigned or who are financially unable to pay dues. The Council proposed to continue to notify the Sections of all terminations, and to publish the names of deceased members in the JOURNAL.

Upon a motion by Dr. McArdle, seconded by Dr. Kaufert, the Council unanimously approved the amendment of Bylaw 23 as follows:

Bylaw 23. Notice of all terminations of membership shall be provided the Sections. The names of deceased members shall be published in Society Affairs.

Resolution on Student Members by New England Section

The following resolution was adopted by the New England Section on February 21, 1952 at the Boston meeting.

Whereas, students in nonaccredited four-year forestry schools or departments are currently ineligible for Student Membership in the Society; and

Whereas, such students need and would benefit greatly in affiliation with the Society during their student years;

Be it therefore resolved that the New England Section in annual meetings assembled go on record as favoring the inclusion of students from nonaccredited four-year forestry schools and departments for student membership in the Society.

Be it further resolved that a copy of this resolution be furnished the Council.

After discussion, on motion by Mr. Brown, seconded by Prof. Marckworth, the Council unanimously voted to table the resolution on the ground that its recommendation is not practicable for the following reasons:

1. Student Members, under the Constitution and Bylaws, are eligible for Junior Membership immediately upon graduation without payment of the customary admission fee of $5. Students who graduate from nonaccredited schools are not eligible for the Junior Grade, but may apply for Affiliate Membership and then advance to the Junior grade after obtaining two years of qualifying experience subsequent to graduation.

2. To be eligible for the Student grade, students must be enrolled in an approved curriculum as well as in an accredited school. Not all students in nonaccredited schools are enrolled in curricula which include the five professional courses basic to the career in forestry.

3. To admit *all* students in nonaccredited schools to Student Membership would grant them a privilege not available to *all* students enrolled in accredited institutions.

Students in nonaccredited schools are permitted to subscribe to the JOURNAL at $3 per year, half the regular subscription rate. This is the same rate charged for Student Membership which includes a subscription to the JOURNAL.

Council Committee on Membership

Because of increased demands on his time, R. E. McArdle, chairman of the Council Committee on Membership, found it necessary to resign from the committee. He was replaced by C. Otto Lindh.

The committee now has the following personnel:

Chairman, Frank H. Kaufert; C. Otto Lindh, and D. B. Demeritt.

This committee acts on all membership applications except in those cases when a negative vote is registered, on which occasion the application is referred to the whole Council for decision.

Honorary Member Elected

On the recommendation of the Committee on International Relations (Tom Gill, chairman), and on motion by Mr. Lindh, seconded by Dr. McArdle, the Council voted unanimously to elect Prof. Enrique Beltran of Mexico to Honorary Membership.

He is professor of conservation of natural resources in the Escuela Normal Superior, and professor of protozoology in the graduate school of the Mexican National University.

The undisputed leader of Mexican conservation, and probably in all Latin America, Prof. Beltran has written numerous publications, and has taught many of the foresters who graduated in Mexico during the past twenty years. Many of his eleven books and 200 scientific articles have been translated for foreign publications.

Membership Increases

Membership as of May 31, 1952 showed an increase of 11 percent over 1951 for the same period. Membership by grades is as follows:

Grade	May 31, 1951	May 31, 1952
Fellow	55	64
Member	3413	3471
Junior	3441	4048
Student	613	720
Affiliate	234	322
Associate	206	211
Corresponding	55	56
Honorary	12	13
	8029	8905

Table 1 shows membership by Sections and grades. The Southeastern Section leads in the number of members with the Columbia River Section a close second. During the year ending May 31, 1952, 1384 applications were received.

It is hoped that the continued activity of the Sections, membership committees, and Section representatives at forestry schools will result in 9,000 members by November 30, 1952.

Accrediting Procedures

The following recommendations were received from Myron Krueger, chairman of the Committee on Accrediting.

TABLE 1.—MEMBERSHIP BY SECTIONS MAY 31, 1952

Section	Rank	Total	Junior	Member	Fellow	Affiliate	Associate	Student
1. Allegheny	7	569	248	221	4	10	15	71
2. Appalachian	5	606	298	237	4	12	5	50
3. Central Rocky Mountain	16	257	94	145		5	4	9
4. Central States	4	633	334	167	2	11	13	106
5. Columbia River	2	740	372	291	4	23	12	38
6. Gulf States	6	584	271	210	2	57	15	29
7. Inland Empire	19	187	92	69	1	3	3	19
8. Intermountain	20	183	71	101				11
9. Kentucky-Tennessee	21	171	68	90		3	6	4
10. New England	8	554	217	242	5	32	20	38
11. New York	10	390	161	176	4	6	10	33
12. Northern California	3	706	294	278	8	36	22	68
13. Northern Rocky Mountain	18	190	95	82	1	1	1	10
14. Ozark	13	300	130	102	1	30	5	32
15. Puget Sound	9	453	198	172	3	26	8	46
16. Southeastern	1	835	488	221	2	27	15	82
17. Southern California	14	106	50	36	2	6	3	9
18. Southwestern	17	197	97	87		8	3	2
19. Upper Mississippi Valley	12	343	146	135	2	12	9	39
20. Washington	15	268	61	160	12		28	7
21. Wisconsin-Upper Michigan	11	351	161	145	2	13	13	17
No Section Affiliation[1]	....	213	102	104	5	1	1	....
Corresponding Members	....	56	....	....	....	....	....	....
Honorary Members	....	13	....	....	....	....	....	....
Total membership		8905	4048	3471	64	322	211	720

[1]Includes 51 inactive and other members in U. S. and foreign countries who have requested that they not be designated as members of any Section.

To the Council: June 2, 1952

The Committee on Accrediting directs the attention of the Council, at its summer meeting of 1952, to the following two items:

1. *Revision of Accrediting Procedures*

There is submitted herewith copies of a proposed revision of the "Bases for Accrediting Schools of Forestry." The Committee, with Paul A. Herbert dissenting, recommends that the Council approve these revisions.

The Committee is aware of the fact that the personnel of the Committee may be completely changed before the next full scale accrediting but recommends the revisions for three reasons: (1) the revisions reflect in large measure what was actually done in the accrediting of 1950, (2) the revisions will serve as a more reliable guide to future committees, and (3) when the executive secretary, in response to requests, sends out information on accrediting procedures of the Society, this information should reflect current practice.

2. *Joint Accreditation with the Professional Societies in Range and Wildlife Management*

This item was first called to the attention of the Council in the annual report of the Committee, submitted at Washington in December 1950. While accrediting of range and wildlife curricula is not contemplated for the near future, it has been given consideration by the professional societies in both of these fields. Even though official accrediting may be five years in the future, the Committee recommends that the Council explore with representatives of these societies the possibility and desirability of joint accrediting so that we shall be prepared when accrediting in either or both of these fields becomes an actuality. Joint accrediting is an essential if we are to avoid serious conflict with the National Commission on Accrediting.

MYRON KRUEGER, *Chairman.*

With respect to the committee's first recommendation, on motion by Dr. Kaufert, seconded by Mr. Porter, the Council voted unanimous approval.

With respect to the second recommendation, on motion by Prof. Marckworth, seconded by Dr. Westveld, the Council authorized Chairman Krueger to explore the possibility of joint S.A.F accrediting with wildlife and range management.

The Council additionally voted to thank this committee for its continuing work in developing high standards of forestry education in America.

Foresters' Manual

The following report, as of May 28, by R. D. Forbes, editor of the *Foresters' Manual*, now under process of compilation as a project of the Society, was read and accepted with thanks.

The status of the 19 subject-matter sections is as follows:

1. Aerial photography. Complete ms. reviewed by editor, mailed to Roy Chapman of Editorial Committee for review.

2. Communications. Complete ms. in editor's hands.

3. Economics and finance. Reviewed by editor and Maughan of Editorial Committee. Final touches only needed.

4. Insects and diseases. Reviewed by editor and Littlefield of Editorial Committee. Final touches only needed.

5. Fire protection. Reviewed by editor and Littlefield. Final touches only needed.

6. Forest measurements. Nearly complete ms. submitted by committee chairman before resigning because of ill-health. Reviewed by editor and returned to committee members and others for checking. Re-submitted mss. awaiting editor's final review.

7. Forest recreation. Complete ms. in editor's hands.

8. Forest-wildlife management. Reviewed by editor and Washington consultants; part reviewed by Littlefield. Final touches only needed.

9. Watershed management. Reviewed by editor and Chapman of Editorial Committee. Final touches only needed.

10. Logging. Reviewed by editor and returned to committee. Re-submitted mss. in editor's hands.

11. Management. Nearly complete ms. in editor's hands.

12. Materials, structures, and facilities. Complete ms. in editor's hands. Committee chairman has resigned.

13. Mathematics. Reviewed by editor and Chapman. Final touches only needed.

14. Physics and chemistry. Complete ms. in editor's hands.

15. Range management. About half of preliminary draft reviewed by editor and Washington consultants. Complete ms. in editor's hands.

16. Silviculture. About 75 percent of ms. in editor's hands. Preliminary review by editor; some portions in controversy.

17. Soils and geology. Reviewed piecemeal by editor and returned to committee. Re-submitted draft 90 percent in editor's hands.

18. Surveying and civil engineering. Reviewed by editor and Maughan. Final touches only needed.

19. Utilization. R. R. Blumenstein new chairman of committee. More than half of ms. in his hands. He has set July 1 as target for submitting completed ms.

The editor expects to put final touches on at least 6 mss. by July 1, for submission to prospective publishers as sample of whole. His major problem is to condense and cut excellent material to fit a publication of 750 pages. Job should be completed by fall.

Journal Advertising

The following report on JOURNAL advertising from Lloyd Thorpe, advertising representative at Seattle, was received and accepted with thanks.

To the Council:

We have now completed three full years of the "experiment" entered into in early 1949 which had for its objective the development of paid advertising in the JOURNAL OF FORESTRY.

It is with considerable personal satisfaction that I am able to report that the experiment has been successful. The following figures, from Miss Warren's audit report, bear out the statement:

Year	Gross advertising	Expense	Net profit
1949	$ 5,091	$1,871	$3,220
1950	10,872	6,162	4,465
1951	14,049	7,248	6,801

The unaudited gross for the first seven months of 1952 is $8,945. Projected to the end of the current year, and contemplating above-average business in the October issue (convention number), 1952 should show a higher total than 1951.

Progress should be weighted by a consideration of the initial handicaps; no budget, no list of prospects, no pro-

motional literature or basic promotional data, a publication virtually unknown among advertisers. These handicaps have now been in large part overcome.

What at first seemed a possibily insurmountable handicap has proved to be practically no problem at all; namely, the handling of advertising sales from the other side of the continent from the publication offices. Air mail, and, occasionally, the long distance telephone are tremendous tools in overcoming time and distance.

We have built up these assets:

1. A small, sound core of regular contract advertisers.
2. An acquaintance with hundreds of prospects and their advertising agencies.
3. A large, currently active, prospect list.
4. A "convention number" which has shown progressively large gains each year since inaugurated in 1949. This annual number has excellent prospects of much further build up, particularly among institutional advertisers.

Progress in interesting advertisers, together with growing circulation, enabled us to raise advertising rates 20 percent, effective May 1, 1952. Rates had been static since 1939. The full effect of the rate increase will not be effective until January, 1953, since it was necessary to accord certain extensions to current advertisers. The present rate of $120 per page, one-time basis, is still too low for nearly 10,000 circulation, however, and plans are already being drawn for a further increase as soon as practicable.

Our present greatest need is for additional and more effective promotional literature. However, we need much more data on our readers, on which to base the promotional material. Also, it should be pointed out, higher costs of postage, paper, printing, and labor make it obvious that the promotional dollar has shrunk.

Future promotion will be aimed at (1) retaining present advertisers, (2) building up the convention number, (3) and cultivating some further basic and prospectively lucrative categories of advertisers, such as tractors, wire rope, and tires.

In conclusion, I want to express sincere appreciation of Henry Clepper for the high compliment he has paid me by permitting me to operate practically on my own. Also, I must emphasize that, without Miss Audrey Warren's long experience in publishing, her practical knowledge of advertising mechanics, and her eager and sympathetic attitude and her always very prompt and courteous cooperation, it would have been quite another matter to carry on as successfully 3,000 miles away.

Personally, and as a member of the Society of American Foresters, I have greatly enjoyed building up the advertising side of the JOURNAL OF FORESTRY and I look forward to many additional years of building.

LLOYD THORPE.

Subscription Rate for Journal of Forestry

Because of increased costs of printing and paper, Miss L. A. Warren, business manager of the Society, recommended that the subscription rate for the JOURNAL OF FORESTRY be increased from $6 to $7.50 for general (nonmember) subscribers of whom there are now 1,038.

On motion of Mr. Lindh, seconded by Mr. Thompson, the Council voted affirmatively 8 to 1 for the recommended increase.

Canadian postage will now cost 50 cents additionally, and foreign postage $1 additionally.

This is the first increase in the subscription price of the JOURNAL since January 1947. Prior to that time it had been $5 per year.

The Council voted unanimously to retain the subscription price for student subscribers at $3.

Reappointment of Executive Secretary

The constitution provides that "The Executive Secretary shall be appointed by the Council which is empowered to enter into contractual relations with him during the period not exceeding two years for which he is appointed."

FIRST CHOICE FOR ROUGH COUNTRY...
KING COMPLETE FRONT-MOUNT WINCH

The KING Model 100 power-take-off driven Complete Front-Mount Winch Assembly is pictured above on a Willys Station Wagon being demonstrated in France, during the North Atlantic Pact military demonstrations.

Designed and engineered primarily to help geophysical crews get in and out of rough locations. KING Winches are in wide use throughout the world, keeping rolling stocks moving. The result of over 20 years of leadership in front-mount winches, KING Winches are light weight, properly balanced and ruggedly braced for years of active service.

After exhaustive performance tests and price comparisons, many State Forestry Departments and Federal Branches have approved KING for active Forestry Patrol.

Whether crankshaft driven for 3-speed transmissions or power-take-off driven for 4-speed transmissions, as shown above, KING Winches are "factory fit" for Willys, Ford, Chevrolet, GMC and some Dodge trucks.

• KOENIG ALL STEEL JEEP CABS AVAILABLE TOO!

Write for bulletins on KING Complete Front-Mount Winch Assemblies to fit your trucks.

Koenig IRON WORKS

2214 Washington Avenue Houston 10, Texas

On motion by Mr. Demmon, seconded by Mr. Porter, the Council voted unanimously to reappoint Henry Clepper as executive secretary for the period ending July 1, 1954.

On motion by Dr. McArdle, seconded by Dr. Kaufert, the Council directed Mr. Clepper to continue as managing editor of the JOURNAL.

Committee on Safety

A report from the Society's Committee on Safety (Seth Jackson, chairman) was read and accepted with thanks. The report was reviewed carefully by a committee of the Council (Kaufert, Porter, and Thompson) who recommended the following action by the Council.

The Council then unanimously approved the following policy, copies of which are to be sent to all the schools of forestry, the Sections, and Chapters.

In line with the recommendations of the Committee on Safety the Council recommends that foresters:

1. Acquaint themselves with the safe practices applicable to occupations related to their fields.
2. Acquaint themselves with the procedures for getting safe practices into use,
3. Actively participate in safety programs, and
4. That schools of forestry indoctrinate students in the principles of safety.

Awards of Pinchot and Schlich Medals

Upon a motion by Mr. Demmon, seconded by Mr. Thompson, the Council voted unanimously to make the seventh award of the Sir William Schlich memorial medal during the annual meeting in Montreal on November 19. The name of the recipient will not be announced until the joint S.A.F.-C.I.F. dinner that evening.

Upon a motion by Mr. Thompson, seconded by Dr. Kaufert, the Council voted unanimously to make the second award of the Gifford Pinchot medal during the annual meeting in Montreal. The name of the recipient will not be announced until the dinner on November 19.

1953 Annual Meeting

Upon a motion by Prof. Marckworth, uling annual meetings by rotation among six geographical regions, the Rocky Mountain area is entitled to the convention in 1953. An invitation to hold the meeting in either Denver or Colorado Springs was received from the Central Rocky Mountain Section.

Upon a motion by Prof. Marckworth, seconded by Mr. Lindh, the Council unanimously accepted the invitation for Colorado Springs. The time will be the middle of September 1953.

Are you thinking about a MICROWAVE communications system?

This handy 5-point check-list will help you get the right equipment for *your* particular needs.

1. How long a system do you need?

Whether it's 20, 200 or 2000 miles long, RCA has the *right* equipment for your job.

- RCA "short-haul" microwave covers the shorter distances up to 200 miles.
- RCA "long-haul" microwave covers the longer distances up to 2000 miles.

So whatever *your* needs, you get the *right* system from RCA.

2. How many channels do you need?

One of RCA microwave's biggest bonus features is *tremendous channel capacity*.

- RCA "short-haul" system provides up to six voice channels including service channel depending upon number of hops. Voice channel can be split into 8 to 16 control channels.
- RCA "long-haul" system provides 24 voice channels plus service channel. Again, any voice channel can be split into 8 to 16 teletype or control channels.

Thus far, no RCA microwave user has ever run out of channels. It seems there's "always room for one more"!

3. What about installation?

RCA will work with you any way you desire.

- If you want equipment only—RCA will supply it.
- If you want installation supervision—RCA Service Company engineers are available.
- Or, RCA Service Company engineers will arrange for the complete installation.

Again, you get just what you want when you specify *RCA* microwave.

4. How about reliability?

Again—what do you need? Can you stand an outage of several hours? Or is uninterrupted service of vital importance? Either way, RCA fits the system to your needs:

- First—by making it *extra* dependable to start with.
- Second—by providing partial standby equipment at inaccessible stations, as needed.
- Third—by providing full standby equipment all along the line, if needed.
- Fourth—by providing emergency 24-hour service on tubes and parts, if desired.

You *get* what you *need* with RCA.

5. How about maintenance?

Again, the RCA Service Company will do any or all of it, as desired. And *only RCA has this nation-wide organization of trained engineers* ready to render this service.

If you want microwave, why take less than RCA?

Why accept less than that provided by the world leader in radio and electronics? RCA has more know-how in high-frequency radio than any other company on earth. And you reap the benefit of this experience when you specify *RCA microwave . . . built and backed by the men who really know radio.*

You get these 7 plus features with RCA Microwave

1. Uses conventional tubes throughout.
2. Easy to tune. Has built-in metering.
3. Handles large number of single sideband frequency division channels without excessive cross-talk.
4. Flexible. Any or all voice or control channels can be picked up or dropped at any station, repeater or terminal.
5. Service channel with signaling available at each repeater and terminal station.
6. Vertical rack design saves floor space, provides ready access both front and rear.
7. Designed, built, and backed up by RCA . . . world leader in radio and electronics.

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Camden, New Jersey

Please send me information on RCA Microwave for the application indicated below:

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☐ Please have an RCA Microwave Engineer call on me.

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Subsequent issues of the JOURNAL will give the names of the committees for this meeting.

Income Tax Regulations on Cost of Tree Planting

The following letter was received on March 28 by President Drake from Ralph W. Marquis, chairman of a committee authorized by the Division of Economics and Policy to study the effect of forest taxation on the practice of forestry. With his letter, Dr. Marquis transmitted a resolution adopted by the Kentucky-Tennessee Section on November 17, 1951. This resolution follows the letter.

Dear Mr. Drake:

Not long ago I received from E. G. Wiesehuegel, a member of the Committee on Forest Taxation, a copy of a resolution adopted by the Kentucky-Tennessee Section urging an adjustment of the income tax regulations to provide an option in expensing or capitalizing the cost of tree planting. A copy of this resolution is attached.

Since the resolution requests the Council of the S.A.F. to consider proposing the suggested legislation to the 82nd Congress, Mr. Wiesehuegel suggested that I send copies of the resolution to committee members to determine whether the committee would recommend to the Council the proposed change in legislation. In accordance with this suggestion I canvassed the members of the committee. Their reaction was that the committee favors the proposed change. A word of caution was sounded, however, regarding the timing of the proposal.

Similar legislation has been proposed in the past and has met with a cool reception. The effect of the proposal would be to reduce current revenue to the government if planting costs were deducted as expenses rather than capitalized. And the present Congress in its search for additional revenue and means of reducing expenditures could not be expected to look with great favor on the proposal.

I believe I can speak for the committee in saying that we believe the proposed change in legislation would stimulate tree planting and forest conservation in general. We urge the Council to consider the Kentucky-Tennessee resolution seriously. I can also offer the services of the committee in preparing background material, justification and proposed wording, should the Council desire this.

RALPH W. MARQUIS

Whereas, reforestation in the area of the Kentucky-Tennessee Section is proceeding at a pace under which it will take many decades to complete the needed reforestation; and

Whereas, as a consequence large acreages of land capable of producing timber and national wealth now lie idle and unproductive; and

Whereas, it is believed good government policy to place such land in forest production at a more rapid rate; and

Whereas, it is believed that this may be partially accomplished by adjustments in income tax procedures in a manner which should prove beneficial to long term income tax returns to the federal government;

Therefore, be it resolved, that

1. The Kentucky-Tennessee Section in meeting assembled requests the Council of the S.A.F. to consider proposing legislation to the 82nd Congress looking toward the adjustment of the income tax regulations, to provide that costs of tree planting may be treated either as a capital expense to be added to the depletion base or as an operating expense at the option of the taxpayer.

2. Copies of this resolution be forwarded to each Senator and Congresman representing the area covered by the Kentucky-Tennessee Section for their information.

Adopted by Kentucky-Tennessee Section
November 17, 1951.

During the discussion of this resolution, President Drake read letters from private foresters whose opinions he had invited prior to the Council meeting. In general, the sentiments expressed were not favorable for seeking a revision of the act at this time.

On motion by Mr. Brown, seconded by Mr. Porter, the Council decided unanimously that the present time is inopportune to carry out the recom-

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New SOUTHERN GLO is the result of years of experiments . . . is so radically different you'll recognize its savings immediately. Yet new SOUTHERN GLO costs no more than old type paints.

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mendations of the Kentucky-Tennessee Section without further, nation-wide study of the possible effects of the proposal. Dr. Marquis has been requested by President Drake to submit additional information and justification.

Miscellaneous

A communication was received from H. H. Chapman with respect to two alleged breaches of the code of ethics. The letter was referred to the Committee on Ethics (E. L. Demmon, chairman).

A report was made by the executive secretary on plans and programs for the joint meeting of the Society and the Canadian Institute of Forestry, to be held in Montreal on November 17-20, and was approved.

By unanimous vote the Council delegated to the executive secretary authority to approve applications for automatic advancement from Junior membership to the Member garde. This authority extends only to those applications that are not in controversy or protested. Applications of questionable qualifications will be referred to the Council Committee on Membership, as in the past.

The Council reviewed the organization and activities of the 11 subject Divisions. Prior to the next annual meeting at which Division meetings will be held (1953), the Council will confer with the Division officers for the purpose of proposing more joint meetings and possibly consolidating some existing Divisions.

By unanimous vote the Council authorized the appointment of a small committee to work with the executive secretary on the clarification of Section bylaws. Some Section bylaws have become inconsistent with the Constitution; some have overlapping boundaries; still other provide for certain membership procedures which have become obsolete.

During Dr. McArdle's absence from the conference, the Council voted to congratulate him on his appointment as chief of the Forest Service. A member of the Council since 1948, Dr. McArdle is the first person to serve on the Council while simultaneously acting as chief of the Service since Robert Y. Stuart who was chief and Council member during the period 1928-1931.

Mr. Thompson, chairman of the Committee on Policies and Objectives, stated that the committee is making progress on its assignment, and will report at the November meeting.

The Society's salary scales and pension plan for employees was reviewed. The Council will give further study to these matters, after developing more information, with a view toward reconsideration at the November meeting.

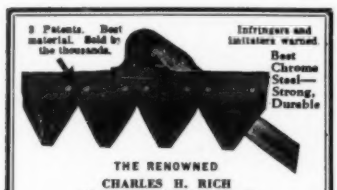
At the close of the conference, the Council thanked Mr. Lindh for making the arrangements for the meeting, and expressed special appreciation to the supervisor Walter Graves and the personnel of the Carson National Forest for their hospitality and many courtesies.

Soils Committee Meets

The Forest Soils Committee of the Douglas-fir Region met in Centralia, Wash., June 6 and 7. There were 27 present, including members and visitors, representing the following agencies: Soil Conservation Service, U. S. Forest Service, Bureau of Land Management, Division of Forest Pathology, Washington State Division of Forestry, Oregon State Board of Forestry, University of Washington, Washington State College, Oregon State College, Crown Zellerbach Corporation, Simpson Logging Company, St. Paul and Tacoma Lumber Company, and Weyerhaeuser Timber Company. The *Timberman* magazine was represented by its new editor, Albert Arnst.

The principal business of the meeting was the discussion of slash burning practices and methods of financing forest soils research. A subcommittee was formed to draw up proposed work plans for some of the more important forest soils problems. These plans will be submitted to the different land owners and agencies for further consideration. The possibility of obtaining financial aid for graduate study on these problems was also mentioned.

The secretary reported that the manual of standard procedures for sampling and analysis is nearing completion and will be submitted for publication in the near future. Short discussions were given on some soil-site correlation studies being conducted by the Soil Conservation Service and on an experimental mustard seeding for soil stabilization being carried on by the Bureau of Land Management and several private operators on a 1951 burn in western Oregon. The group toured portions of the Weyerhaeuser Timber Company's McDonald Tree Farm inspecting recent and older plantations and aerial seeding projects on an old burn, newly logged areas scheduled for slash burning, recent slash burnings, regeneration on burned and unburned slash areas, cat logging shows, and a regeneration and soil moisture study area. Quality of nursery stock, pre-planting soil surveys, effects of cat logging on soils,



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and the problem of slash burning were included in the discussions during the tour. Vincent Bousquet and Francis Neumen, foresters for the Vail-McDonald Tree Farms, presented case histories and answered the numerous questions about the areas visited.

The Forest Soils Committee is jointly sponsored by the Puget Sound and Columbia River Sections of the Society.

C. T. YOUNGBERG.

Columbia River Section Reports

The Columbia River Section is completing its first year of operation as a fully decentralized Section.

Under bylaws adopted a year ago, each Section member automatically becomes a member of a chapter, usually the one for the area in which he maintains his residence. His principal Society activities then center in his chapter. His chapter meetings become his sustained local source of contact with the Society of American Foresters. The lines of communication to the Society nationally are brought closer to individual members through their recognized local chapter. The Section membership still means something, and there still are Section activities. But under this type of organization, the center of attention swings from the Section to the chapter.

The Columbia River Section began the year with eight chapters. Within the last two months, a ninth chapter has been formed. This new chapter, the Blue Mountain, now covers a substantial area of what was previously a very large chapter area. All the chapters of the Section have had at least four meetings this year, and some will have had as many as eight by the time the present Section year is completed. Most of the chapters have had at least one field trip type of meeting.

There have also been some notable Section activities during the year. One was a fall meeting and banquet at the time of the Western Forestry and Conservation Association's 42nd annual meeting in Portland. Governor Len B. Jordan of Idaho was the banquet speaker. Another Section occasion was a spring meeting and field trip on the Eugene area in May. The field trip was followed by an evening banquet. For this meeting former Governor Charles A. Sprague of Oregon was the principal speaker. A third Section event on the calendar for mid June of this year was participation in a meeting of the Western Section of the American Association for the Advancement of Science. The Columbia River Section is having joint meetings with groups from the American Ecological Society and the American Nature Study Society.

Officers elected and appointed for the Section year commencing July 1, 1952 are:

James E. Sowder, Bend, Ore., chairman.

Thomas J. Orr, Jr., Klamath Falls, Ore., vice chairman.

Kenneth Burkholder, Bend, Ore., secretary.

Vondis E. Miller, Prineville, Ore., treasurer.

A. W. GREELEY, *Secretary*

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Estimates—Appraisals—Surveys
Machine Tree Planting Service
107 HOMESTEAD RD., ITHACA, N. Y.

Candidates for Membership

Candidates for admission, advancement, or reinstatement whose membership applications were received in the Society office during the month of June are listed below.

Action regarding the eligibility of these candidates will be taken by the Council as of August 1, 1952. Any communications from voting members relating to the membership eligibility of any of these candidates should be received in the Society office prior to that date.

Allegheny Section

Student Grade

PENNSYLVANIA STATE COLLEGE

Arnold, W. H.; Fowkes, J. W.; Kulman, H. M.; Rapp, S. R.; Smith, D. P.; Sumner, D. K.

WEST VIRGINIA UNIVERSITY

Kidwell, F. D.

Junior Grade

Crawshaw, H. L., Gen. Mgr., Markleton Lbr. Co., Rockwood, Pa.; Univ. of Mass., B.S.F., 1950.

Ludwig, W. J., Lbr. Salesman, Northwest Lbr. Co., Pittsburgh, Pa.; Pa. State, B.S.F., 1950.

Student Members Proposed for Advancement

PENNSYLVANIA STATE COLLEGE

Arnold, W. H.; Fowkes, J. W.; Kulman, H. M.; Smith, D. P.

WEST VIRGINIA UNIVERSITY

Gillespie, W. H.; Jenkins, E. P.; Kidwell, F. D.; Miller, W. L.; Oyden, E. P.; Westfall, C. Z.

Member Grade

Frantz, H. R., Forester, INCODEL, Bethlehem, Pa.; Pa. State, B.S.F., 1936. (Junior, 1946).
Worley, D. P., Asst. Prof., Pa. State College, State College, Pa.; State Univ. of New York, B.S.F., 1943; Duke, M.F., 1947.

Affiliate Grade

Gruss, M., Asst. Engr., Dept of Cons., Trenton, N. J.; Rutgers Univ., B.S., (Agric), 1943.

Appalachian Section

Student Grade

NORTH CAROLINA STATE COLLEGE
Derro, J. J.; Whippie, T. G.

Junior Grade

Graham, J. E., Asst. Forester, S. C. State Comm. of Forestry, Columbia, S. C.; N. C. State, B.S.F., 1952.
Horn, F. W., Asst. Forester, S. C. State Comm. of Forestry, Spartanburg, S. C.; Univ. of Idaho, B.S.F., 1949.
Jervey, A. P., Field Buyer, Koppers Co., Inc., Charleston, S. C.; N. C. State, B.S.F., 1951.
Reger, M. V., Dist. Forester, Champion Paper and Fibre Co., Canton, N. C.; Mich. State, B.S.F., 1942.

Student Members Proposed for Advancement

DUKE UNIVERSITY
Rhett, R. B.

Member Grade

Crouch, R. T., Field Repre., N. C. Pulp Co., Plymouth, N. C.; Univ. of Fla., B.S.F., 1943. (Junior, 1946).
Korb, H. W., Div. Forest Engr., Int. Paper Co., Georgetown, S. C.; Pa. State, B.S.F., 1942. (Junior, 1949)
Lee, R. K., Asst. Forester, Lightsey Bros., Miley, S. C.; N. C. State, B.S.F., 1940. (Junior, 1946).
Maynard, J. T., Mgr., Charles Ingram Lbr. Co., Florence, S. C.; N. C. State, B.S.F., 1943. (Junior, 1946).
Pew, E. D., Field Supv., Cape Fear Wood Corp., Conway, S. C.; Pa. State, B.S.F., 1939. (Junior, 1947).

Central Rocky Mountain Section

Junior Grade

Love, L. D., Forester, Rocky Mt. Forest and Range Exp. Sta., Ft. Collins, Colo.; Colo. A & M., B.S.F., 1930.

Central States Section

Student Grade

MICHIGAN STATE COLLEGE
Wegryn, W.

UNIVERSITY OF MICHIGAN
Backels, J. F.

Junior Grade

Gerlach, J. R., Forester, Cleveland Metropolitan Park Dist., Cleveland, Ohio; Univ. of Mich., B.S.F., 1949; M.S., (Cons), 1951.
Nelson, R. E., Assoc. Ext. Forester, Dept. of Forestry, Univ. of Ill., Urbana, Ill.; Mich. State, B.S.F., 1936.

Student Members Proposed for Advancement

MICHIGAN STATE COLLEGE
Wegryn, W.

Member Grade

Bozett, W. J., Farm Forester, State of Ohio, Div. of Forestry, Logan, Ohio; West Virginia Univ., B.S.F., 1947. (Junior, 1949).
Houf, W. E., Forester, Ohio Dept. of Natural Resources, Ashland, Ohio; Univ. of Mich., B.S.F., 1948. (Junior, 1948).
McFarland, I. H., Dist. Forester, Cons. Dept., Marshall, Mich.; Univ. of Mich., B.S.F., 1947; M.F., 1947. (Junior, 1948).
Miller, L. O., Dist. Forester, Courthouse, Cassapolis, Mich.; Mich. State, B.S.F., 1937. (Junior, 1947).

From the time he leaves his home, General Logging Superintendent Tony Zaffel is in touch with the job via the G-E 2-way radio.

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Employing a practical yet technical approach, this text is a broad introductory treatise which presents in concise form information on the origin, methods of conversion, and utilization of the principal primary and secondary forest products in America, as well as those from other parts of the world that are important in the American economy. Technical phases of manufacturing are treated without undue emphasis on minute technical and production details. The text is comprised of four major sections: Economics of Forest Utilization; Wood Products; Chemically Derived Products from Wood; and Derived and Miscellaneous Wood Products.

Other Important Books

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OREGON STATE COLLEGE

Bunker, G. E.; Forehlick, H. A.; Smith, C. W.

Junior Grade

Malloy, E. J., Asst. Logging Supt., Medford, Corp., Butte Falls, Oreg.; Univ. of Wash., B.S.F., 1940.
McMinn, D. R., Forester, Crown Zellerbach, Seaside, Oreg.; Oregon State, B.S.F., 1949.
Munson, W. E., Lbr. Buyer, Long-Bell Lbr. Co., Longview, Wash.; Iowa State, B.S.F., 1949.
Rogers, J. G., Forest Engr. Asst., Longview Fibre Co., Longview, Wash.; Univ. of Idaho, B.S.F., 1951.

Student Members Proposed for Advancement

OREGON STATE COLLEGE

Bunker, G. E.; Froehlich, H. A.; Smith, C. W.

Member Grade

Cooper, L. J., Dist. Rgr., Rouge River Natl. Forest, Medford, Oreg. (Junior, 1949).
Gearhart, R. C., Mgr. Western Office, American Forest Products Industries, Inc., Portland, Oreg.; Univ. of Mich., B.S.F., 1939. (Junior, 1947).
Lewis, C. S., Forester, Coos Head Tbr. Co. Coos Bay, Oreg.; Oregon State, B.S.F., 1942. (Junior, 1945).
Ogle, C. E., Sec-Mgr., Assoc. Forest Industries of Oreg., Salem, Oreg. (Aff.42J46).
Yoder, R. E., Field Sec., Western Forest Industries Assoc., Portland, Oreg.; Iowa State, B.S.F., 1938. (Junior, 1943).

Affiliate Grade

Borchgrevink, K. G., Asst. Mgr., Bork Lbr. Co., Vancouver, Wash.; Oregon State, B.S., (Wood Utilization), 1948.
Rudolph, H. B., Forestry Aid, U.S.F.S., Eugene, Oreg., Wash. State, B.S.F., 1951.
Sisson, V. E., Fire Chief, Dept. of Interior, U.S. Indian Service, Klamath Agency, Oreg.

Gulf States Section

Junior Grade

Grillot, I. F., Junior Forester, Kirby Lbr. Corp., Cleveland, Ohio; La. State, B.S.F., 1950.

Inland Empire Section

Student Grade

UNIVERSITY OF IDAHO

Stickney, P. F.

Junior Grade

Student Members Proposed for Advancement

Stickney, P. F.

Member Grade

Grover, E. T., State Forester, State of Idaho, Coeur d'Alene, Idaho; Univ. of Idaho, B.S., 1950; M.F., 1951. (Junior, 1949).

Affiliate Grade

Olson, R. J., Nursery Forester, S.C.S., Pullman Wash.; Wash. State, B.S., (Forestry), 1948.
Wigal, H. L., Cruiser, Twin Feather Mills, Inc., Kamiah, Idaho; State College of Wash., B.S.F., 1950.

Intermountain Section

Junior Grade

Student Members Proposed for Advancement

Birch, J. E.; Hart, W. J.; May, W. T.; Weissert, R. H.

Member Grade

Hjort, G. V., Forester, Boise Payette Lbr. Co., Boise, Idaho; Univ. of Idaho, B.S.F., 1930. (Junior, 1945).
Mueller, W., Dist. Forest Rgr., Yellowjacket Rgr. Dist., Cobalt Idaho; Univ. of Idaho, B.S.F., 1941. (Junior, 1946).
Rozynek, W. S., Forester, U.S.F.S., Hailey, Idaho; Utah State, B.S.F., 1942. (Junior, 1946).

Kentucky-Tennessee Section

Junior Grade

Shotner, W. D., Forester, Draper Corp., Paris, Tenn.; N. C. State, B.S.F., 1951.

Sturdivant, A. E., Supv., Div. of Forestry, Kentucky Ridge Forest, Pineville, Ky.; West Va. Univ., B.S.F., 1951.

Member Grade

Nelson, R. D., Forester, T.V.A. Forestry Relations Dept., Paris, Tenn.; La. State Univ., B.S.F., 1941. (Junior, 1947).

New England Section

Student Grade

UNIVERSITY OF MAINE

Kellogg, R. M.

New York Section

Junior Grade

Preston, J. O., 125 Sterling St., Greenport, N. Y.; State Univ. of N. Y., B.S.F., 1950.

Student Members Proposed for Advancement

STATE UNIVERSITY OF NEW YORK

Donovan, W. J.; Lanner, R. M.

Member Grade

Faust, R. R., Woodroom Supt., Longlac Pulp and Paper Co., Terrace Bay, Ontario, Canada. (Junior, 1947).

Gaskins, W. W., Instructor, State Univ. of New York, Syracuse, N. Y.; Mich. State, B.S.F., 1947; M.S.F., 1948. (Junior, 1948).

Losee, S. T. B., Chief Photogrammetrist, Abitibi Power and Paper Co., Ltd., Sault Ste. Marie, Ontario, Can.; Univ. of Toronto, B.S., (Forestry), 1931. (Junior, 1949).

Northern California Section

Student Grade

UNIVERSITY OF CALIFORNIA

Laush, J.; Mak, K. R.; Walke, W. J.

Junior Grade

Archibald, P. L., U.S.F.S., Pollock Pine, Calif.; Univ. of Me., B.S.F., 1949; Univ of Mich., M.F., 1952.

Student Members Proposed for Advancement

UNIVERSITY OF CALIFORNIA

Andrews, W. B.; Bash, D. R.; Berridge, R. D.; Bolster, W. R.; Busby, F. M.; Cheshire, J. T.; Crebbin, P. E.; Dunham, M. A.; Fish, H. S.; Gavin, W. H.; Griffin, J. R.; Griffin, J. P.; Harmon, J. R.; Hart, J. E.; Heasley, W. L.; Helsing, R. E.; Hurd, R. V.; Kirkendall, P. G.; Laush, J.; Lowe, W. H.; Lyon, C. B.; Mak, K. R.; Marsh, L. W.; McClellan, G. E.; Miner, R. W.; Munnich, K. A.; Munster, G. H.; Nile, J. B.; O'Kelly, T. J.; Osburn, V. R.; Owens, H. B.; Payne, F. L.; Perry, J. L.; Pland, R. H.; Price, L. S.; Price, V. R.; Robinson, G. P.; Smith, V. E.; Steed, G.; Steinhouse, J. E.; Stroupe, H. I.; Walker, W. J.; Williams, C. L.

Member Grade

Craig, G. A., Chief, Associate Editor, "The Timberman," Portland, Oreg.; Univ. of Calif., B.S.F., 1939. (Junior, 1946).

Drown, E. A., Forester, Shasta National Forest, Mt. Shasta, Calif.; Utah State, B.S.F., 1938. (Junior, 1946).

Holmes, O. L., Asst. Rgr., U.S.F.S., Berry Creek, Calif., Colo. A & M., B.S.F., 1947. (Junior, 1949).

Affiliate Grade

Waddell, T. J., Headquarters Asst., U.S.F.S., King City, Calif.; Wash. State College, B.S., (Forestry), 1950.

Northern Rocky Mountain Section

Junior Grade

Student Members Proposed for Advancement

MONTANA STATE UNIVERSITY

Cullen, D. W.; Frizzell, M. M.; Howard, H. R.; Prussing, F. W.; Waterman, C. J.

Ozark Section

Junior Grade

Student Members Proposed for Advancement

UNIVERSITY OF MISSOURI

Coplen, W. C.; Ochrymowych, J.

Affiliate Grade

Hawk, J. V., 1112 N. Douglas, Oklahoma City, Okla.; Okla. A. & M., B. S., (Forestry), 1952.

Puget Sound Section

Student Grade

UNIVERSITY OF WASHINGTON

Prochnau, J. W.

Junior Grade

Voss, G. L., Public Relations Asst., Simpson Logging Co., Shelton, Wash.; Mont. State Univ., B.S.F., 1951.

Student Members Proposed for Advancement

UNIVERSITY OF WASHINGTON

Buchanan, J. L.; Burr, A. L.; Daub, H. A.; Drake, E. G.; Farley, D. L.; Fournier, E. A.; Henderickson, J. P.; Herold, J. H.; Lawson, W. L.; Madsen, E. K.; McGowan, J. R.; Monahan, J. E.; Nelson, J. W.; Power, A. D.; Price, G. W.; Prochnau, J. W.; Vail, S. A.; Wagar, J. A.; Welsh, D.; Wilson, C. N.

Affiliate Grade

Johnston, H. C., Field Repre., Milwaukee Land Co., Beaver, Wash.; State College of Wash., B.S. (Forestry), 1950.

Learnard, R. K., Cons., S.C.S., Puyallup, Wash.; State College of Wash., B. S., (Forestry), 1950.

Southeastern Section

Student Grade

UNIVERSITY OF FLORIDA

Bennett, W. M.; Buckhalt, J. E.; Drake, H. E.

Junior Grade

Halls, L. K., Range Cons., U.S.F.S., Tifton, Ga., Colo. A. & M., B.S.F., 1947; Texas A. & M., M.F., (Forestry), 1948.

Student Members Proposed for Advancement

UNIVERSITY OF FLORIDA

Buckhalt, J. E.; Drake, H. E.

UNIVERSITY OF GEORGIA

Rodgers, M. F.

Member Grade

Watson, J. H., Asst. to Exec. Vice Pres., Ala. Forest Products Assn., Montgomery, Ala.; Univ. of Ga., B.S.F., 1939 (Junior, 1947).

Affiliate Grade

McCain, J. W., Woods Mgr., Foley Lbr. Industries, Inc., Foley, Fla.

Southern California

Junior Grade

Gregg, E. H., 175 N. Wilson Ave., Pasadena, Calif.; Univ. of Calif., B.S.F., 1951.

Southwestern Section

Member Grade

Engstrom, G. E., Dist. Forest Rgr., U.S.F.S., Taos, N. Mex.; Colo. A. & M., B.S.F., 1933. (Junior, 35R51).

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UNIVERSITY OF MINNESOTA

Shenkyr, D. W.

Junior Grade

Allyn, A. D., Dist. Forester, State Cons. Comm., Fairfield, Iowa.; Iowa State, B.S.F., 1946. Reinstatement.

Swanson, W. E., Forest Rgr., Minn. Dept. of Cons., Cook, Minn.; Univ. of Minn., B.S.F., 1950.

Student Members Proposed for Advancement

IOWA STATE COLLEGE

Connor, R. C.; Hansen, R. C.; Micklewright, J. T.; Wilson, J. O.

UNIVERSITY OF MINNESOTA

Shenkyr, D. W.

Member Grade

Baker, B. C., Soil Scientist, S.C.S., Devils Lake, N. Dak.; Univ. of Idaho, B.S.F., 1941. (Junior, 1947).

Serber, A. T., Area Supv., Minn. Forest Service, Orr, Minn. (Junior, 1946).

MacConnachie, W. M., Forester, Northwest Paper Co., Cloquet, Minn.; Univ. of Mich., B.S.F., 1947; M.F., 1947. (Junior, 1947).

Affiliate Grade

Brooks, B. F., Woods Mgr., Kirk Minnesota

Wisconsin-Upper Michigan Section

Member Grade

Parfitt, E. E., Land Appraiser and Negotiator, Nevin Hatchery, Madison, Wis.; Univ. of Mich., B.S.F., 1946. (Junior, 1948).

Sturgeon, E. E., Asst. Prof., Mich. College of Mining and Tech, Sault Ste Marie, Mich.; Univ. of Mich., B.S.F., 1940; M.F., 1941. (Junior, 1944).

Foreign

Honorary Grade

Beltran, Enrique, Prof. Conservation and Natural Resources, Escuela Normal Superior, Mexico.; Columbia Univ., Ph.D., 1933.

Bulletin on Spruce Management Issued by New York Section

The New York Section has published a series of articles dealing with the management and use of spruce trees and wood in northeastern United States and Canada. These articles are condensed from papers given at the annual meeting of the New York Section in January 1952.

Single copies of the May issue of the *New York Forester*, which is made up of these articles, may be obtained at a cost of 30 cents from J. E. Davis, secretary-treasurer New York Section, Society of American Foresters, State University of New York, College of Forestry, Syracuse 10, N. Y.

Journal of Forestry Subscription Rates Increased

Effective with the January 1950 issue the JOURNAL OF FORESTRY format was changed, allowing more material to be printed in a volume, and increasing the service generally to readers. An increase in subscription rates was not made at that time. However, in view of the additional service to JOURNAL readers and increased editorial, clerical, and printing costs, annual subscription rate of the JOURNAL OF FORESTRY will be increased to $7.50 annually, effective January 1953. (Additional postage, foreign $1; Canadian, 50 cents.)

Current rate of $6 annually will apply for renewal subscriptions expiring prior to December 31. Renewals and new subscriptions starting January 1953 will be billed at the new rate of $7.50 annually.

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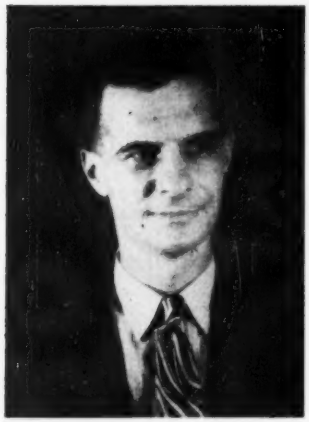
Forestry News

W. S. Swingler, Assistant Chief, U. S. Forest Service

William S. Swingler, regional forester, U. S. Forest Service, Philadelphia, has been appointed assistant chief of the service in charge of cooperative forestry programs. Swingler succeeds R. E. McArdle, who became chief of the Forest Service July 1.



WILLIAM S. SWINGLER

In his new position Swingler will head up Forest Service participation in programs worked out with 43 states and the Extension Service to help private landowners improve and manage their woodlands. He also will be in charge of Forest Service cooperation with states in the protection of state and privately owned land against forest fires.

After graduation from the Pennsylvania State Forest School in 1921, Mr. Swingler was employed by the Pennsylvania Department of Forests and Waters as assistant district forester and district forester until 1935. He worked a few months with Soil Conservation Service and transferred to the Forest Service in 1936 to head up forest surveys in New Hampshire and Vermont.

In 1937 he was assigned to work with Northeastern States in improving cutting and forestry practices on privately owned timberlands. Following the New England hurricane in 1938, he was detailed to the New England Timber Salvage Administration to clean up the fallen timber. After a year he returned to his work with private landowners, and in 1944 was made assistant regional forester in charge of this work for the 14 states in the Northeastern Region.

Before his transfer to California in 1946, Swingler worked on two special assignments. Between 1943 and 1944 he was regional project chief for the Timber Production War Project. He served as civilian forestry advisor on General MacArthur's staff in Japan between 1945 and 1946. He has been a member of the Lands Committee of the Interstate Commission on the Potomac River Basin since 1951.

Charles L. Tebbe, Regional Forester

Charles L. Tebbe, general inspector for the Forest Service, has been named head of its Northeastern Region, with headquarters at Philadelphia, Pa. Mr. Tebbe succeeds William S. Swingler, who recently was made an assistant chief.

"Mr. Tebbe's past experience in handling cooperative work with California, states in the Pacific Northwest, and at the national level in Washington, together with his administrative experience as director of the Northern Rocky Mountain Forest and Range Experiment Station, well qualify him for his new position," said Lyle F. Watts, chief of the Forest Service.

Mr. Tebbe received his B.S. degree in forestry from the University of California at Berkeley in 1929. After four years in private industry on the West Coast and in the Philippine Islands, he was employed by the California Forest and Range Experiment Station of the Forest Service at Berkeley, Calif. In 1935 he went to the California regional office at San Francisco as an assistant logging engineer, and two years later was put in charge of cooperative forestry programs with the state.

He was transferred to Washington, D. C. in 1939 to handle programs and educational material in the Division of Information and Education. He next headed up cooperative work with the states in promoting better management of private lands for a year before becoming liaison officer between the Forest Service and the War Production Board in 1941.

In 1943 he was made assistant regional forester in charge of cooperative state and private work in the Pacific Northwest Region. Three years later he was promoted to the position of director of the Northern Rocky Mountain Forest and Range Experiment Station at Missoula, Mont. His headquarters have been in Washington, D. C. since 1950.

Forest Management Areas on Public Lands in Arkansas

Approximately 112,000 acres of public domain forest land in Arkansas have been set aside by secretarial order as a forest management area under the administration of the Bureau of Land Management.

"Aid to flood control and watershed protection and development are two important aspects in retaining these Arkansas forest lands in public ownership," Secretary of the Interior Oscar L. Chapman said, pointing out that this conclusion is the result of cooperative investigations undertaken with other federal forest and watershed management agencies.

Reservations of these Arkansas public lands is furthermore in aid of sustained-yield forest management, Secretary Chapman said. Management of the Arkansas area will be similar in many ways to that of the Oregon and California railroad revested grant lands of western Oregon. The O and C lands are managed by the Bureau of Land Management.

In addition, Secretary Chapman stated, sustained-yield management of these forests under the Sustained-yield Forest Act of 1944, will help stabilize employment, local forest industries, the local tax base, and other social and economic factors of the community.

The scattered tracts of public domain—varying in size from approximately 40 acres to 160 acres in 17 northern Arkansas counties—are suitable and valuable for the sustained-yield production of timber and for maintaining benefits usually derived from forests, such as water supply, sustained stream flow, prevention of soil erosion, and preservation of wildlife and recreational values.

The Bureau of Land Management has recently established a district forestry office at Russellville, Ark., which handles the sale of timber and other surface resources under the Materials Act of 1947. Applications for mineral and other land entry under appropriate land laws on public lands in Arkansas should be directed to the Bureau of Land Management, Washington 25, D. C.

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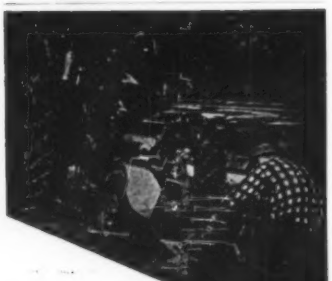

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RUSSELL K. LEBARRON, for seven years chief of forest management research at the Northern Rocky Mountain Forest and Range Experiment Station, has been transferred to the California Forest and Range Experiment Station. He will be in charge of forest management and silvicultural research for the California Station. He succeeds Duncan Dunning, who retired in 1951.

At the Northern Rocky Mountain Station, LeBarron has directed research into problems of growing white pine, ponderosa pine, lodgepole pine, larch, and fir. As author of 25 scientific papers and manuals, he has contributed substantially to present-day forest practices in Idaho, Montana, and eastern Washington. He previously served 14 years at the Lake States Forest Experiment Station, where he specialized in studies of management of spruce and jack pine.

J. J. de Gryse Retires

J. J. de Gryse, chief, Division of Forest Biology, Science Service, Department of Agriculture, Ottawa, retired on May 11 after 29 years' service. A graduate of Louvain University, Belgium, specializing in the morphology of Lepidopterous larvae, and at one time on the staff of the Bureau of Entomology, U. S. Department of Agriculture, Washington, Mr. de Gryse joined the Canada Department of Agriculture on August 14, 1923, as an assistant entomologist and was stationed at the Forest Insect Laboratory, Indian Head, Saskatchewan.

In 1925, he was transferred to Ottawa, in 1936 made chief of the Division of Forest Insects, and in 1951 appointed chief of the recently organized Division of Forest Biology. Because of his broad experience, Mr. de Gryse was prevailed upon to continue his duties beyond the normal retirement age.

The rapid expansion of the scientific staff and facilities and the initiation of a sound research program in the Division of Forest Biology is directly attributable to the energy and foresight of Mr. de Gryse. The division has developed one of the strongest units in the study of insect diseases and already the modern Laboratory of Insect Pathology, opened in May 1950, at Sault Ste. Marie, Ont., has made a notable contribution through its virus spray investigations.

F. G. Wilson Leaves Wisconsin Forestry Post

F. G. Wilson of Madison, Wis. has resigned his position as superintendent of cooperative forestry with the Wisconsin Conservation Department.

With the adoption, by unanimous vote of the county board of supervisors, of the cutting budget for the 225,000-acre Marinette County Forest, Mr. Wilson had succeeded in establishing a schedule of allowable annual cut for the decade based on interpretation of aerial photographs, sample plots, and growth data.

For the immediate future, he intends to engage in professional travel and writing.

DR. MALCOM L. PREBBLE has been appointed chief of the Division of Forest Biology, Science Service, Department of Agriculture, Ottawa, succeeding Mr. J. J. de Gryse. Dr. Prebble, until his new appointment, has been officer-in-charge of the Forest Biology Laboratories at Sault Ste. Marie, Ont.

A native of Saint John, N. B., he joined the Forest Insect Laboratory of the Department at Fredericton, N. B., in 1928. He received his B. Sc. degree in forestry from the University of New Brunswick in Fredericton in 1930, and his M.Sc. and Ph.D. degrees from McGill University in 1932 and 1940, respectively. Dr. Prebble was attached to the Fredericton laboratory until 1940 when he was transferred to the Forest Insect Laboratory in Victoria, B.C. In 1945, he was appointed officer-in-charge of the Forest Insect Laboratory at Sault Ste. Marie. He is noted for his special studies on the European spruce sawfly and other insect pests common to Canadian forests.

Engineer-Forester Joins TECO Laboratory Staff

Robert J. Hoyle, Jr., 32, mechanical engineer and forester has joined the research staff of Timber Engineering Company, affiliate of National Lumber Manufacturers Association.

A Cornell graduate in mechanical engineering, Mr. Hoyle received his M. S. degree in forestry from the New York State College of Forestry at Syracuse this June. Additional studies include structural and railway engineering at the University of Wisconsin, and chemical engineering at the University of Rochester, N. Y.

He has done instrument, plant, and equipment engineering and designing for Taylor Instrument Companies, Distillation Products Industries, and Eastman Kodak Company. He has conducted research work in kiln drying at the Forest Products Laboratory, and served as kiln drying consultant to private firms.

Mr. Hoyle's first assignment at the laboratory is designing new glue laminated products having practical applications that will extend present markets and develop new ones for wood.

Iverson Succeeds Paul Roberts

Floyd Iverson, formerly assistant chief of the Division of Range and Wildlife Management, U. S. Forest Service, Portland, Ore., has been appointed chief of the Division of Range and Wildlife Management in the Northern Region office in Missoula, Mont. He succeeds to the position vacated by the retirement of Paul Roberts last December.

FLOYD IVERSON

Mr. Iverson is a graduate of the University of California, having received his degree in forestry and range management in 1933. He went to work for the Forest Service doing range inventory work on the Trinity National Forest in California. In 1937 he became district ranger on the Modoc National Forest and there followed assignments as ranger and staff officer on the Modoc and other California national forests. In 1945 he became supervisor of the Inyo National Forest where he served until 1948, at which time he was promoted to the position of assistant chief in the Portland, Ore. office.

Association Executives Meet in Texas

The fourth annual meeting of the Council of State Forestry Association Executives was held in Lufkin, Texas, June 18 and 19. There were 17 members and guests in attendance.

William E. Cooper, executive director of Virginia Forests, Inc., Richmond, was elected chairman for the coming year. He succeeded L. L. Bishop of the Texas Forestry Association, Lufkin.

Harris A. Reynolds of Boston, secretary of the Massachusetts Forests and Parks Association, was elected vice chairman; and A. W. Kelly of the West Virginia Forest Council, St. Albans, was elected secretary.

The 1953 meeting is expected to be held in Virginia.

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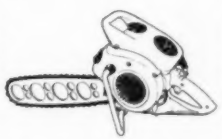

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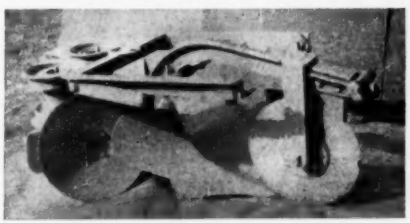

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Noted British Chemist Joins Forestry College

Dr. Michael Szware of the University of Manchester, England, has been appointed to the newly established professorship of physical and polymer chemistry at the State University of New York College of Forestry at Syracuse.

Dr. Szware "will help us build a strong center of academic training and research in cellulose and polymer chemistry," Dr. Hardy L. Shirley, acting dean of the forestry college, said in announcing the appointment. Earlier steps were taken when full-time research in the field was begun in 1948; and when senior and graduate training in plastics technology was established in 1949. These developments were directed by Dr. Edwin C. Jahn, professor of forest chemistry and research director, with whom Dr. Szware will work closely.

"With the new appointment, the College of Forestry intensifies its program in chemistry areas related to wood cellulose, paper, lignin, and other forest products of constantly growing importance," Dr. Shirley said. "To further the program, other staff additions are contemplated, and excellent new facilities will be provided in the wood products laboratory building, plans for which are now being drawn for an estimated expenditure of $2,500,000."

Dr. Szware is internationally known for basic research into chemical reactions and the energies of chemical bonds. He has been identified in recent years especially with work on high temperature homogeneous reaction kinetics. For this he was awarded the honorary Doctor of Science degree in 1949 by the University of Manchester. Previously he had earned the Ph.D. degree in physical chemistry there, and the Ph.D. degree in organic chemistry at the Hebrew University of Jerusalem.

During World War II Dr. Szware was with the Scientific Advisory Committee for the British War Supply Board of the Middle-East, carrying out industrial research and building small chemical plants in middle-eastern countries.

Advisory System Improvements Proposed for Agriculture

Recommendations designed to strengthen the advisory system for agricultural research were adopted by the Agricultural Research Policy Committee (established under the Research and Marketing Act of 1946 to advise the Secretary of Agriculture on research and marketing work) at its quarterly meeting May 22-23. Among these were the following:

1. That a national forestry research advisory committee be established on a temporary basis.

2. That a working group survey the present research on soils, water, and fertilizers, and report its recommendations to the Policy Committee next winter.

3. That a similar working group be set up to consider present research on production economics.

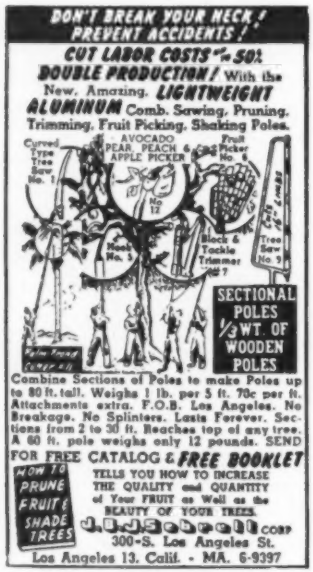
4. That the Policy Committee begin immediately a study to determine just what kind and how large an agricultural research program is needed during the next several years.

The committee also urged legislation to authorize contracting of agricultural research on production problems so that emergency research demands might be handled more readily. The Agricultural Research Administration already has authority to make contracts with outside agencies for research in marketing or utilization of agricultural products.

Monsanto Establishes Preservatives Section

An industrial preservatives section in the development department of Monsanto Chemical Company's Organic Chemicals Division under the managership of Ira Hatfield, was established July 1. It will be concerned with product development in the general field of industrial preservatives. This will include wood preservation in which Hatfield has been prominent for many years. For 16 years, he has been closely associated with Monsanto's research, development and sales aspects.

A graduate of Simpson College, Hatfield has done graduate work in botany, plant physiology, and pathology at Colorado Agricultural College and the University of Wisconsin. From 1929 to 1936, he was employed by the U.S. Deparment of Agriculture, Division of Forest Pathology, Bureau of Plant Industry at the U. S. Forest Products Laboratory, Madison, Wis., and at Southern Forest Experiment Station at New Orleans, La. During this period he performed research on chemicals for the control of biological organisms in wood. In 1936, Hatfield joined the research department of Monsanto's Organic Chemicals Division in St. Louis to work on the preservation of wood and other cellulosic products.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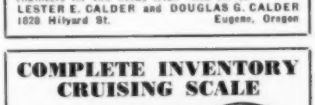

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Denham Heads Northwest Range Program

Avon Denham, assistant chief of range management, U. S. Forest Service, for the past three years, has been named to head up national forest range activities in Washington and Oregon. He will be succeeded by Charles A. Joy, assistant regional forester in charge of range management in California since 1946.

In his new position, Mr. Denham will be responsible for grazing permits and range improvement work on 19 national forests in Washington and Oregon. He succeeds Earl D. Sandvig, who is going to Chile on a special assignment.

A native of Olathe, Colo., Mr. Denham spent his early years on a ranch. After graduation from the Colorado State College of Agriculture in 1928, he was employed by the Forest Service as a ranger in Colorado. Between 1929 and 1949 he served as district ranger, assistant forest supervisor, and forest supervisor of the Montezuma National Forest in Colorado, and as assistant to the head of range management for the California Region.

Mr. Joy, who took over his new job July 6, has since his first job on a survey crew in 1922, served as assistant district ranger and district ranger in Montana, as supervisor of forests in Montana and Colorado, and as range examiner for the Northern Region (Montana, northern Idaho, eastern Washington, and northwestern South Dakota) and the Southwestern Region (Arizona and New Mexico).

A native of Terre Haute, Ind., Mr. Joy received his B.S. degree in forestry from the University of Montana.

Biological Warfare Waged Against Sawfly

Biological warfare was successfully waged against the European pine sawfly on the Henderson State Forest in northern Illinois in May, reports Dr. D. M. Benjamin of the Milwaukee Forest Insects Station of the Bureau of Entomology and Plant Quarantine.

Entomologists from that office introduced a virus disease to the forest May 9 and 10, a very specific disease which attacks only the one species of insect and presents no danger to other insects or animals. It takes the disease approximately 10 days to take hold, after which the sawfly larvae die by the millions.

The state forester's office, which made the evaluation of results, reported very good control.

Grantham, Acting Director, Oregon Products Laboratory

A new acting managing director of the Oregon Forest Products Laboratory at Corvallis, J. B. Grantham, has been named by Paul M. Dunn, dean of forestry at Oregon State College and laboratory director.

Since 1951 Grantham has been chief of the physical research and development division of the laboratory, also serving as head of the forest products department of the Oregon State College School of Forestry, a position he has held since 1947.

Grantham came to Oregon State College in 1945 from the Texas Forest Service where he was in charge of research.

L. D. Espenas, who has been in charge of seasoning projects at the laboratory since 1947, will become chief of the physical research and development division of the laboratory. Espenas was formerly with the U. S. Forest Products Laboratory at Madison, Wis.

The acting managing directorship was filled to replace Dr. Phimister B. Proctor, who is on military leave of absence.

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Mississippi Forest Products Rank High in State Economy

Timber-products industries in Mississippi rank just behind farming in the state's economy, according to a report based on a survey of the state made by the U. S. Forest Service with the cooperation of the Mississippi State Forestry Commission.

Nearly one in every four dollars which Mississipians receive from private enterprise comes directly from timber products. In 1946 the value of the state's raw wood products was $122 million; further manufacture within the state added $130 million. Direct employment in the harvesting and manufacture of timber totals some 68,000 man-years annually.

The report was written by Dr. Lee M. James of the Southern Forest Experiment Station. It summarizes the findings of the second forest survey of the state, made between 1946 and 1948, and compares them with those of the first survey, made between 1932 and 1935.

Fluctuations in business conditions since the early 1930's were reflected in Mississippi's timber output, the report shows. Softwood lumber production, which was down to 0.4 billion board feet in 1932, rose to 0.9 billion board feet in 1947. It never regained the 1925 peak of 2.6 billion board feet; pine forests had been cut too heavily to permit more than a partial recovery.

Hardwood lumber production reached a peak of 0.7 billion board feet in 1946. Since then there have been signs of a decrease in production.

A spectacular advance in pulpwood production has been one of the most significant features of Mississippi's giant wood-using industry in recent years, the report declares. Pulpwood production rose from less than 300,000 cords in 1936 to 1.3 million cords in 1947. The state is now one of the leading pulpwood producers in the Nation.

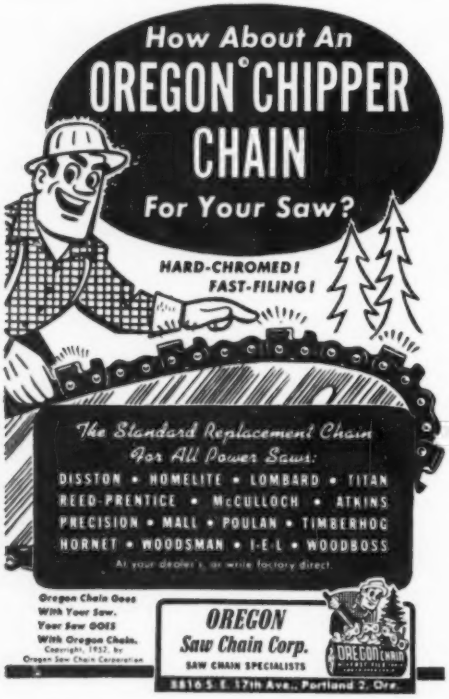
In the period since the first survey, Mississippi has seen more interest in good forest management than at any previous time, and more forestry extension work and research. Large forest acreages have been acquired by companies interested in growing timber as a crop. The state legislature passed a timber harvesting act to encourage improved cutting practices and voted increased funds for fire protection.

Despite these improvements, Mississippi's forests now have 29 percent less softwood timber of sawlog size than when the first survey was made. The drop in hardwood sawlog volume has been 20 percent. The report concludes that unless timber management improves still more rapidly than in the past, the outlook is for a decline in some of the state's important wood-using industries.

Copies of the report may be obtained from the Southern Forest Experiment Station, 704 Lowich Building, New Orleans 13, La.

1952 Keep Green Materials

This year the American Forest Products Industries, Inc. went "all-out" in making Keep Green materials available to the states. In addition to the usual radio spot announcements made available to all newspapers, 3,600,000 pieces of material were shipped to the states for which they were localized. These shipments include a two-fold stuffer, a large *Are You Guilty* poster, and a cartoon booklet, *A Trip Through the Forest With Woody*. Organized Keep Green programs are now operating in 33 states.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Krueger Honored by Union College

Myron E. Krueger, professor of forestry, University of California, was awarded the honorary Doctor of Science degree by Union College at the 157th annual commencement exercises June 8, 1952.

MYRON E. KRUEGER

Mr. Krueger was graduated from Union with the class of 1912. He later studied forestry at Cornell University where he was awarded the B.S.A. degree, and the University of California where he received the M.S. degree in 1917. He started his career in forestry in 1914 working with the U. S. Forest Service and private lumber companies. During World War I he served with the Army Engineers for two years.

In 1925 he joined the faculty of the University of California and since that time has been professor of forestry. From 1943 to 1944 he was coordinator of the Army Specialized Training Program at the Berkeley campus of the university. Following the war, he was Statewide Campus Coordinator of Veterans affairs for two years.

In 1933 he served as chairman of the Northern California Section of the Society of American Foresters and for several years he was a member of the Council of the Society of American Foresters. He is chairman of the Society's Committee on Accrediting Schools of Forestry.

In 1951 Mr. Krueger was elected a Fellow in the Society.

Utah Forestry School Enters Fishery Research

The School of Forestry at Utah State Agricultural College has added to its ranks through association with a new U. S. Fish and Wildlife Service office for fresh water fishery research. The new unit, known as the Rocky Mountain Investigations Unit, occupies quarters in the forestry building on the campus at Logan, and will work closely with the staff on problems of mutual interest in the field of conservation.

For the present, the primary concern of the new fishery office is the fishery of Lake Yellowstone in Yellowstone National Park. An investigation of this water has been under way for the past two summers under Dr. Oliver B. Cope, and it is anticipated that the unit will consider new problems in other waters of the Rocky Mountains in the future.

Lookout Named for C. S. Cowan

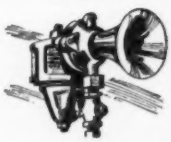
C. S. Cowan, manager of the Washington Forest Fire Association, will be honored by the dedication of a new forest fire lookout in Pacific County. The tower has been named Cowan Peak.

Major Cowan, graduate of Oxford University, England, is one of the pioneers in forest fire prevention and control in the Pacific Northwest. He is a member of the Society of American Foresters, and a trustee of the Keep Washington Green Committee.

Cowan Peak Lookout will be operated cooperatively by the Washington Forest Fire Association, the State Division of Forestry, and the Weyerhaeuser Timber Company.

RAYMOND F. GREFE, now assistant regional engineer has been named chief of the division of engineering, Pacific Northwest region of the U. S. Forest Service.

Grefe, who succeeds James Frankland, recently retired, entered the Forest Service as a ranger in 1916 after having been graduated from the University of Michigan. Shortly after the U. S. entered World War I in 1917, he enlisted in the 10th Engineers and served for two years, re-entering the Forest Service as a deputy forest supervisor on the Grand Canyon forest in Arizona. The same year he resigned and went to Juneau, Alaska, engaging in private engineering work for the next six years. Returning to Oregon, he was appointed superintendent of road construction on the Willamette National Forest. Subsequently, he served on several other forests in both Oregon and Washington, and in 1935 was assigned to the regional division of engineering.



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Forestry Employment

Positions Wanted

Graduate forester, Iowa State College 1951, desires position in private industry as a procurement agent or timber manager. Age 27, married. Previous experience with woodworking firm. Junior Member, S.A.F. **Box G, Journal of Forestry, Mills Building, Washington 6, D. C.**

Desire position in forest survey work, college teaching, or research. Five years in charge of forest inventory of a Canadian province, project nearing completion. Thorough knowledge of practical techniques in photogrammetry and field sampling; supervisory and editorial experience. Age 32, married, 5 children. MF., Michigan, A.B., Princeton, Phi Beta Kappa. **Box H, Journal of Forestry, Mills Building, Washington 6, D. C.**

Forester, B.S.F., 1941, age 33, married, Veteran with photogrammetrical and cartographic experience. Specialist in forest management, truck road construction, logging, trucking, equipment maintenance, and timber acquisition. Six years in present position as chief forester with large land and lumber company. Desires position with progressive company in Appalachian, Lake States, or Northeast region. **Box J, Journal of Forestry, Mills Building, Washington 6, D. C.**

Graduate forester, 27, single, New York State College of Forestry, with varied experience in the lumber business as laborer, foreman, and salesman has now crystallized aims and desires to work in a lumber mill in the West. Want to start at the bottom with aim of training toward mill management. **Box K, Journal of Forestry, Mills Building, Washington 6, D. C.**

Positions Available

Foresters located in field east of Great Plains wanted to collect ownership data in spare time. If you are able to compile forest ownership data from county records (knowledge of forest cover in area essential), write for instructions. Payment will be made on production. Accuracy essential. Future employment opportunities may develop. **Box D, Journal of Forestry, Mills Building, Washington 6, D. C.**

West Virginia Forest Council Elects Officers

The West Virginia Forest Council elected officers during a two-day meeting, May 15 and 16. Heading the group will be Lewis E. Smith, a farmer and stockman from Grantsville. John Tillinghast, a consulting forester of Clothier was chosen vice chairman.

Secretary-treasurer is G. H. Overholt of Charleston, who is also secretary of the West Virginia Forest Fire Protective Association. A. W. Kelly of St. Albans is executive secretary.

The West Virginia Forest Council is financed by private industry and individual memberships and is dedicated to the wise use of West Virginia's renewable natural resources. Particular emphasis is placed upon conservation of soil, water, and forests.

Guides for Marking Southern Upland Hardwoods

Guides for use in deciding when to cut southern upland hardwoods have been issued as Occasional Paper 125 of the Southern Forest Experiment Station. The authors are Joseph L. Burkle and Sam Guttenberg.

The paper discusses southern red oaks, white oaks, and yellow-poplar, and the chief products into which these species are cut, except for tight cooperage bolts and face veneer logs.

Heart of the guides is a method of determining when a tree is financially mature.

Burkle and Guttenberg describe and illustrate the bark and crown conditions that characterize trees of high, medium, and low vigor. They then tabulate net lumber values for trees of the various diameters, species, and grades, and estimate the rate of increase in value that can be expected if the trees in each vigor class are left to grow for five years.

The paper concludes with a set of simple marking guides that can be used in the woods.

School Forest Planting Demonstration A Success

School forest planting demonstrations have been conducted at 108 schools in South Carolina since 1948, according to C. W. Hall Clemson Agricultural College extension forester. These demonstrations conducted cooperatively by the Clemson Extension Service, State Commission of Forestry, pulpwood companies, and school authorities have trained hundreds of 4-H club boys and other rural youth how to plant and care for their forests.

Typical of these demonstrations is the work done at the Eastover school 4-H club demonstration in Richland county. This 4-acre demonstration was planted in 1933. The school forest was marked and given its second thinning during the past year and $213.60 worth of pulpwood was taken out.

In 1933 the land adjacent to the school building was vacant and was not producing an income. J. F. Craig, the school principal, foresaw the possibility that a young growing forest would serve the school not only as a source of possible income but also as a means of teaching young people forest management and conservation. Both possibilities have materialized. From the four acres about $300 has come to the school. The income from the last thinning went to buy needed school supplies to use in the classroom or on the baseball field. The stand is now free of low-grade, disease, and forked trees. The present trees are tall and of good quality and show prospects of making good quality lumber.

Farm Forestry Short Course

A one-week credit course in Farm Forestry for Vocational Agricultural Instructors was conducted June 16-20 at Arlington, Wash., by the Department of Forestry and Range Management of the State College of Washington.

Sixteen high school instructors from western Washington who either are already offering or plan to offer some work in forestry at their high schools attended the course. Activities of the course were directed principally toward the development of forestry projects for the second growth Douglas-fir farm woodlands.

John P. Nagle, associate professor in the Department of Forestry and Range Management of the State College of Washington, directed the course.

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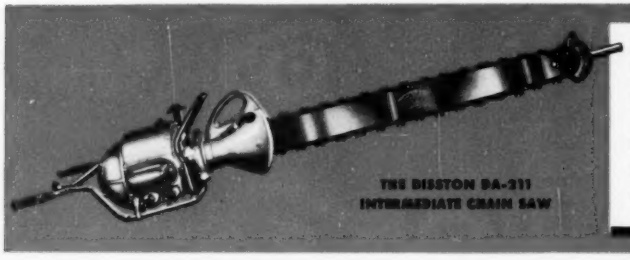

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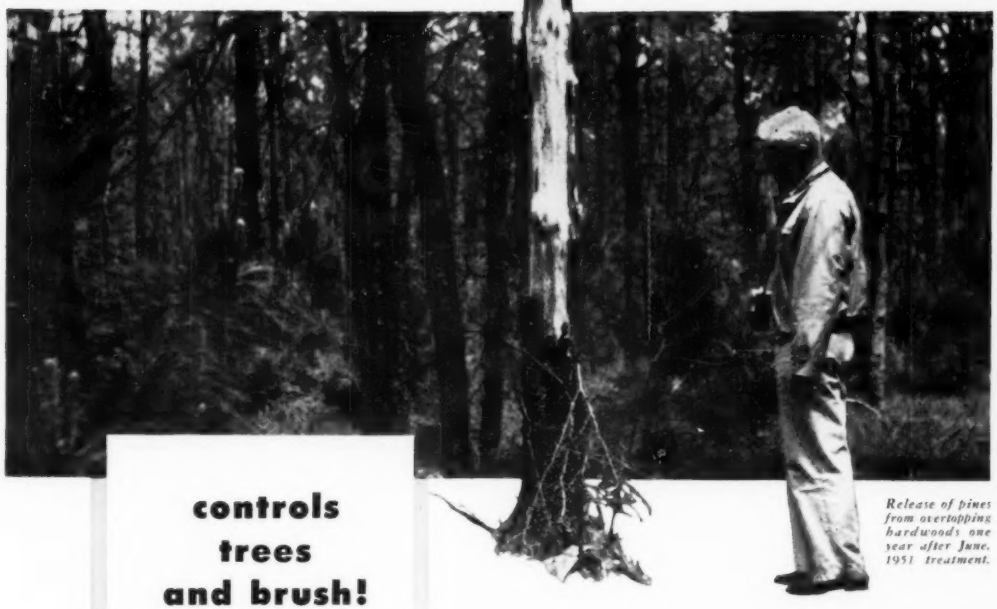

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